

**COMPLETION REPORT
INDEPENDENT REMEDIAL ACTION
BARBEE MILL SEDIMENT CLEANUP PROJECT
LAKE WASHINGTON**

Prepared for
Barbee Mill Company
P.O. Box 359
Renton, Washington 98057

Prepared by
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Lloyd & Associates, Inc.
38210 SE 92nd Street
Snoqualmie, Washington 98065

January 2003



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1 INTRODUCTION

This Completion Report describes the implementation of a sediment cleanup action performed by the Barbee Mill Company in summer/fall 2002 immediately offshore of the Barbee Mill facility located on Lake Washington (Figure 1). The work was conducted under the Voluntary Cleanup Program (VCP), with input from the Washington Department of Ecology ("Ecology"), and in accordance with applicable local, state, and federal permits. The objective of the remedial action was to complete cleanup of sediments offshore of the Barbee facility to achieve applicable State Model Toxics Control Act ("MTCA"; Chapter 173-340 WAC; RCW 70.105D) requirements.

The cleanup project was performed as an Independent Remedial Action under the authorities of MTCA and the Sediment Management Standards ("SMS"; Chapter 173-204 WAC). The project was also authorized under Clean Water Act Permit No. 1995-2-00997 administered by the U.S. Army Corps of Engineers ("Corps"), along with authorization from other applicable state and local agencies.

This report presents a concise narrative discussion of project implementation, and presents the results of performance monitoring confirming that the cleanup action attained site-specific cleanup standards and other performance requirements. Based on the results of the cleanup action as described herein, the Barbee Mill Company requests a No Further Action determination letter from Ecology for sediments offshore of the Barbee facility.

2 PROJECT AND PERMITTING HISTORY

The Barbee Mill Company has conducted dredging for the removal of accumulated sand and gravel in the May Creek Delta for more than 40 years, to facilitate navigation and to reduce the potential for flooding at the Barbee facility. As permitted by the Corps (e.g., Permit No. 1995-2-00997), the Company has also periodically dredged bark and sediment from areas adjacent to the facility to facilitate navigation and log handling operations.

In 1998, the Corps approved the Company's request to increase the volume of material to be dredged from areas adjacent to the facility, and specifically to address nearshore bark accumulations in these areas (Figure 1). This change was incorporated into subsequent federal, state, and local permit approvals and/or modifications, secured by the Company in early 1999 from the following agencies:

- Corps of Engineers
 - May Creek Dredging Permit
 - Bark and Wood Debris Dredging Permit
 - Coastal Zone Consistency
- Washington Department of Ecology
 - Shoreline Approval
 - Water Quality Certification/Modification
- Washington Department of Fish and Wildlife
 - Hydraulic Project Approval
- City of Renton
 - Shoreline Substantial Development Permit/Determination of Non-Significance
 - Special Permit for Grade and Fill

In summer/fall 1999, and in accordance with federal, state, and local permits, the Barbee Mill Company and its contractors dredged the May Creek Delta and a portion of accumulated bark deposits from "Area A" depicted in Figure 1. Approximately 6,000 cubic yards (cy) of bark, wood debris and associated sediment (containing greater than 50 percent wood by volume) were dredged from this area during the 1999 interim action. Manson Construction performed the dredging using a 1-cy barge-mounted clamshell bucket, and transported the materials to adjacent uplands on the Barbee facility for passive dewatering. The materials were managed in accordance with local, state and federal laws. Water quality monitoring conducted during the

dredging operations did not reveal any exceedance of water quality standards (Lloyd 1999). A post-construction habitat survey also documented rapid recolonization of the dredging area by aquatic plants and fisheries resources (Harza 2000).

Dredging was discontinued in late November 1999 when heavy rains and sustained poor weather conditions impeded further dewatering of the dredged material. Shortly thereafter, all work on the project was halted to provide for consultation under the 4(d) rule, to ensure compliance with the federal Endangered Species Act ("ESA").

As requested by the Corps and the federal Services (National Marine Fisheries Service and U.S. Fish and Wildlife Service), the Company submitted a Biological Evaluation/Assessment ("BE/A") in March 2000. However, compliance with ESA was not confirmed by the federal Services and the Corps until late October 2001. At that time, the Corps Permit (No. 1995-2-00997) was extended to November 25, 2002, which also modified the fish closure within Lake Washington, prohibiting dredging during the potential nearshore fish migration period from January 1 to July 15. Subsequent permit modifications allowed the Company to dredge up to an additional 20,000 cy of *in situ* sediment and wood waste from nearshore areas of the facility, in order to complete nearshore sediment cleanup within the areas depicted on Figure 1.

3 NATURE AND EXTENT OF PRIOR SEDIMENT CONTAMINATION

3.1 Initial Investigations

As part of due diligence activities conducted on behalf of JAG Corporation and Port Quendall Company, and in response to Ecology's stated concerns regarding potential wood waste impacts at the Barbee Mill and adjacent Quendall Terminals properties, in 1996 and 1997 sediment quality investigations were performed at the Barbee Mill facility as follows:

- Side-scan sonar and diver surveys to describe the distribution of wood waste debris;
- Sediment profile imaging to delineate wood waste accumulations and redox characteristics; and
- Surface sediment and core sampling, and laboratory analysis of these samples, to characterize sediment chemical concentrations.

These site characterization data, reported in ReTec (1997), were used to generally delineate the extent of wood wastes requiring cleanup, and specifically within Area A, as generally depicted in Figure 1.

As discussed above, an interim remedial (dredging) action was performed in 1999 to remove Area A bark accumulations. Shortly thereafter, the Company performed additional sediment surveys adjacent to the facility. These sampling data revealed that wood waste materials (greater than 50 percent by volume) were present in areas immediately west of the Barbee facility (denoted Areas A, B and C in Figure 1; Lloyd 1999).

In 2000, Exponent conducted a further assessment of the deleterious properties of wood waste in the general site area by performing laboratory bioassay tests on those "gray zone" sediments at the Quendall Terminals property containing between roughly 20 and 50 percent wood waste by volume (and with no identified exceedances of other chemical criteria). The bioassay testing methods and interpretive guidelines were developed with Ecology and other stakeholders, and followed procedures previously established under the SMS for marine sediments (Exponent 2001). Sediment samples were collected from 9 locations at the Quendall Terminals property, as well as from matched reference sites, and submitted for 10-day *Hyalella* survival and growth tests, 10- and 21-day *Chironomus* survival and growth tests, and a Microtox™ 100 percent sediment porewater test. Three of the 9 sediment samples containing the highest concentration of wood wastes exhibited sufficient

toxicity in the 21-day *Chironomus* survival test to exceed Ecology's cleanup screening level ("CSL") guidelines. Significant sediment toxicity was not observed in any of the other samples or bioassays.

Wood wastes (predominantly relatively small sized bark components) present in the Quendall Terminals sediment bioassay samples exhibited similar grain size and other characteristics as wood wastes present at the Barbee Mill facility. At both properties, the likely origin of wood wastes was from log rafting activities that occurred historically throughout the area. Because of the similarity of these wood waste materials, Ecology agreed that bioassay data obtained at the Quendall Terminals property may be used to evaluate cleanup requirements at the Barbee Mill facility (Adolphson 2002), as discussed below.

3.2 Site-Specific Sediment Cleanup Levels

In 1997, Ecology developed chemical criteria, denoted Freshwater Sediment Quality Values ("FSQV"), to predict possible biological effects in freshwater sediments resulting from chemical releases (Cabbage et al. 1997). In developing these chemical-based criteria, data from several bioassays (including *Hyalella*, *Chironomus*, and Microtox™ tests, among others), and corresponding chemical analyses were merged from numerous regional studies into a single database. Based on statistical analyses of these data, Ecology developed FSQVs based on a combination of marine SMS values (metals), and probable apparent effects thresholds for Microtox™ (organics), which together are used as thresholds to detect potential adverse biological effects to freshwater biota.

As presented in Anchor (2002), only one chemical – total organic carbon ("TOC") – exceeded the FSQV in pre-dredging sediment samples collected from the Barbee Mill facility. Sediment TOC concentrations as high as 24 percent were detected in surface sediment samples collected by ReTec (1997), exceeding the FSQV of 14 percent. However, all sediment samples collected from the Barbee Mill property were well below sediment screening levels for polynuclear aromatic hydrocarbons and other hazardous substances. Based on these data, with the exception of wood waste and associated TOC, chemical concentrations in Barbee Mill sediments are below levels of potential sediment quality concern.

Ecology has determined that the SMS provides authority in WAC 173-204-520(5) to require cleanup of "other deleterious substances" on a case-by-case basis, in order to protect human health and the environment. The term "other deleterious substances" is defined in WAC 173-204-200(17), and specifically includes organic debris (Kendall and Michelsen 1997).

Consistent with the Exponent (2001) bioassay results, and data from other similar wood waste sites, the degree of adverse biological effects of wood waste in the general site area, as determined from the Quendall sediment bioassays, was correlated with sediment TOC concentrations (Anchor 2002). Ecology (Adolphson 2002) determined that TOC levels are predictive of biological effects in this application, and developed the following site-specific cleanup standards for Barbee Mill sediments:

- Total organic carbon (TOC) = 13.5 percent (dry weight basis); and
- Wood waste = 50 percent (volumetric basis).

Ecology's site-specific cleanup standards (Adolphson 2002) also included statistical compliance provisions for evaluation of post-cleanup performance monitoring data. Specifically, no single post-dredge performance monitoring sample may exceed a TOC of 16.9 percent or a wood waste level of 75 percent. Moreover, if individual sediment samples exceed either of the two cleanup levels listed above, a statistical analysis of the data would be performed. The statistical analysis would involve calculating the 95th percentile upper confidence limit (95%UCL) of the mean concentration of samples collected within the dredge area, and comparison of the 95%UCL with cleanup levels. Consistent with SMS guidelines, sediments at the Barbee Mill site that meet these statistically-based cleanup standards would not have the potential to pose adverse biological effects on freshwater biota. The dredging boundary generally depicted on Figure 1 was developed to achieve compliance with these statistically-based cleanup standards.

3.3 Baseline Sediment Characterization

Prior to initiating dredging actions at the site, and as requested by Ecology, in early May 2002 the Barbee Mill Company performed a pre-construction baseline sediment quality survey to refine the boundaries of the remedial action area, relative to the site-specific cleanup standards discussed above. This was performed by collecting a total of 21 surface

sediment samples on approximate 125-foot centers, as generally depicted on Figure 2. As set forth in the SMS, the general point of compliance for achieving cleanup levels is the upper 10 centimeters (cm) of sediment, and baseline surface grab samples were collected from this interval. Sediment samples were collected with a 0.1-m² modified stainless steel van Veen grab sampler, consistent with current Puget Sound Estuary Program ("PSEP") protocols. The baseline sampling program is documented in Anchor (2002).

Each baseline sediment sample was visually inspected to determine the volumetric percentage of wood waste, and was also submitted for analysis of TOC and other parameters using current PSEP methods. Maximum baseline concentrations of TOC (46 percent) and wood waste (90 percent) detected at the site exceeded the site-specific cleanup action levels discussed above (Anchor 2002). Overall, 16 of the 21 baseline sediment samples collected at the site exceeded the site-specific cleanup levels for TOC and/or wood waste. Consistent with Ecology direction (Adolphson 2002), the remedial action boundary was defined by a line equidistant between those samples that exceeded the cleanup levels and those that did not. Figure 2 presents the refined cleanup action boundary.

The areal extent of the sediment cleanup area delineated in this manner was approximately 5.8 acres (Figure 2). Based on these data and other available site characterization information (e.g., ReTec 1997), up to 20,000 cy of bark, wood debris, and associated sediment within the 5.8-acre area was targeted for removal during the 2002 remedial action

4 REMEDIAL ACTION

Similar to the 1999 interim action, Manson Construction was retained in summer 2002 by the Barbee Mill Company to remove bark, wood debris, and associated sediment (up to 20,000 cy of *in situ* materials) from the delineated cleanup area depicted in Figures 1 and 2. Because of the correspondence between TOC and wood waste volumetric percentage at the site (Anchor 2002), Manson targeted a wood waste level of less than 50 percent in dredged materials removed from the site (i.e., in the dredge bucket) as an initial indication of when cleanup had been completed within a given operation area. Sediment cleanup was confirmed through detailed performance monitoring, discussed below in Section 5. All materials (sediment and water) were managed in accordance with local, state and federal laws and permit requirements. Water quality monitoring was conducted during the dredging operation as specified in project permit documents, and in a manner similar to the previous 1999 monitoring (Lloyd 1999). Dredging operations and water quality monitoring results are discussed below.

4.1 Dredging Operations

Dredging operations were initiated in late July and were completed in late October 2002. Dredging of the wood waste and bark accumulation areas depicted on Figure 2 was conducted with a 1-cy barge-mounted clamshell dredge owned and operated by Manson Construction. Dredge spoils were placed in one of two scows. As one scow was being filled, the other was unloaded. In general, the clamshell dredge made two passes over the lakebed to achieve the targeted wood waste level of less than 50 percent in individual dredge buckets/grids. Consistent with the baseline sediment sampling data, the volume of bark and wood debris was highest in nearshore areas (approximately 50 to 200 feet from shoreline) and decreased with distance offshore. A total of approximately 20,000 cy of bark, wood debris, and associated sediment was removed from the site during the 2002 remedial action. Dredge production rates during the action were typically less than 500 cy/day.

Dredging of the May Creek Delta occurred concurrent with the wood waste and bark cleanup project. Manson used a larger 5-cy clamshell dredge to accomplish dredging within the May Creek Delta.

The dredge scows were unloaded from shore with excavators and placed in an upland passive dewatering cell within the temporary dredge material storage area located on the

small peninsula between Area A and May Creek (Figure 1). Once the materials (sand/gravel or bark/wood debris) were sufficiently dewatered for handling, the dredge spoils were excavated and trucked further from the shoreline (within the Barbee facility property). Passive dewatering within the temporary dredge storage area achieved handling specifications, although fine sediment accumulation on the bottom occasionally impeded infiltration. Periodic excavation of fine materials on the bottom of the dredge storage area served to restore adequate rates of infiltration for dewatering. Characterization of the dredged materials for potential beneficial reuse is discussed below in Section 6.

4.2 Water Quality Performance Monitoring

Throughout the dredging operations, a silt curtain was placed in the water along the entire dredge boundary generally depicted on Figure 1. Filter fabric was hung on log booms interlinked with existing piling to provide a secure silt fence. The curtain was weighted so that it rested on the bottom of the lakebed.

Water quality monitoring was performed at regular intervals (11 sampling events) during the remedial action to ensure water quality protection in the area during the conduct of the action. Water quality measurements were routinely collected at three stations located outside of the silt curtain within or near May Creek (Stations 1 through 3), and at four stations inside the silt curtain approximately 30 to 50 feet from the working dredge or unloading operations (Stations 4 through 7; Table 1). These measurements included mid-depth determinations of temperature, dissolved oxygen, conductance, and turbidity. Water quality monitoring data collected during the 2002 action are summarized in Table 1.

Similar to conditions reported in 1999 (Lloyd 1999), at no time during the 2002 dredging operations was water quality degraded within the silt curtain to below applicable state water quality standards (Chapter 173-201A WAC). Relatively little turbidity was detected during the dredging operations, and was highly localized and transient. Turbidity was maintained below state standards and rarely exceeded May Creek background levels (Table 1). Similarly, no significant oxygen depletion was observed, and dissolved oxygen levels were maintained above applicable lake water quality standards (greater than 8 mg/L dissolved oxygen), even adjacent to the clamshell dredge during dredging operations. No fish distress was observed during the dredging operations.

Table 1
Water Quality Performance Monitoring Data Summary - 2002

Sampling Date and Location	Sampling Location	DO (mg/L)	Temperature (°C)	Water Temp. (°C)
02/26/02				
Station 1 - Pedestrian Bridge	Barb Area A	8.1	12.5	20.2
Station 2 - Vantage Bridge	Barb Area A	8.3	11.1	19.2
Station 3 - SW Point	Barb Area A	8.4	11.5	20.9
Station 4 - Beam Dock (Area A)	Barb Area A	8.4	12.0	22.8
Station 5 - Water Dock (Area C)	Barb Area A	8.1	12.1	22.9
Station 6 - Active Drainage Area	Barb Area A	8.2	12.1	22.9
Station 7 - Sewer Unloading Area	Barb Area A	8.4	13.1	19.5
03/05/02				
Station 1 - Pedestrian Bridge	Barb Area A	8.4	14.0	22.2
Station 2 - Vantage Bridge	Barb Area A	11.2	18.7	18.6
Station 3 - SW Point	Barb Area A	8.8	21.3	21.8
Station 4 - Beam Dock (Area A)	Barb Area A	8.5	23.5	20.2
Station 5 - Water Dock (Area C)	Barb Area A	8.7	24.0	20.2
Station 6 - Active Drainage Area	Barb Area A	8.7	24.0	20.2
Station 7 - Sewer Unloading Area	Barb Area A	9.4	23.5	20.7
04/24/02				
Station 1 - Pedestrian Bridge	Barb Area A	10.0	17.8	16.0
Station 2 - Vantage Bridge	Barb Area A	9.7	27.0	15.0
Station 3 - SW Point	Barb Area A	8.4	31.0	18.0
Station 4 - Beam Dock (Area A)	Barb Area A	8.5	4.00	21.8
Station 5 - Water Dock (Area C)	Barb Area A	9.7	1.20	22.8
Station 6 - Active Drainage Area	Barb Area A	8.5	4.10	21.0
Station 7 - Sewer Unloading Area	Barb Area A	8.8	3.00	22.0
05/17/02				
Station 1 - Pedestrian Bridge	Barb Area B	10.8	12.1	13.8
Station 2 - Vantage Bridge	Barb Area B	8.2	17.8	15.8
Station 3 - SW Point	Barb Area B	8.5	30.7	21.4
Station 4 - Beam Dock (Area A)	Barb Area B	8.2	1.88	21.4
Station 5 - Water Dock (Area C)	Barb Area B	8.3	2.87	21.8
Station 6 - Active Drainage Area	Barb Area B	7.8	4.70	21.8
Station 7 - Sewer Unloading Area	Barb Area B	7.5	3.48	21.5
06/18/02				
Station 1 - Pedestrian Bridge	Barb Area B	10.0	14.2	20.7
Station 2 - Vantage Bridge	Barb Area B	8.7	1.18	17.1
Station 3 - SW Point	Barb Area B	8.8	1.18	18.1
Station 4 - Beam Dock (Area A)	Barb Area B	8.7	1.18	22.0
Station 5 - Water Dock (Area C)	Barb Area B	8.5	1.18	20.5
Station 6 - Active Drainage Area	Barb Area B	8.8	1.15	20.5
Station 7 - Sewer Unloading Area	Barb Area B	8.8	1.16	19.6
07/27/02				
Station 1 - Pedestrian Bridge	Barb Area B	8.0	1.12	20.7
Station 2 - Vantage Bridge	Barb Area B	8.2	1.18	17.1
Station 3 - SW Point	Barb Area B	8.4	1.18	18.7
Station 4 - Beam Dock (Area A)	Barb Area B	9.0	1.83	22.5
Station 5 - Water Dock (Area C)	Barb Area B	8.8	1.99	20.8
Station 6 - Active Drainage Area	Barb Area B	8.8	1.83	20.3
Station 7 - Sewer Unloading Area	Barb Area B	9.1	1.18	18.5
08/16/02				
Station 1 - Pedestrian Bridge	Barb Area B	8.7	1.58	20.7
Station 2 - Vantage Bridge	Barb Area B	8.4	1.24	17.1
Station 3 - SW Point	Barb Area B	8.8	1.26	18.7
Station 4 - Beam Dock (Area A)	Barb Area B	9.0	1.27	22.5
Station 5 - Water Dock (Area C)	Barb Area B	9.1	1.29	20.8
Station 6 - Active Drainage Area	Barb Area B	8.8	1.48	20.3
Station 7 - Sewer Unloading Area	Barb Area B	9.0	1.23	18.5
09/19/02				
Station 1 - Pedestrian Bridge	Barb Area B	8.2	1.10	18.8
Station 2 - Vantage Bridge	Barb Area B	9.7	1.14	15.0
Station 3 - SW Point	Barb Area B	9.0	1.33	18.4
Station 4 - Beam Dock (Area A)	Barb Area B	8.7	1.18	18.8
Station 5 - Water Dock (Area C)	Barb Area B	8.7	1.38	22.1
Station 6 - Active Drainage Area	Barb Area B	8.3	5.10	18.0
Station 7 - Sewer Unloading Area	Barb Area B	8.7	2.58	18.7
09/26/02				
Station 1 - Pedestrian Bridge	Barb Area B	8.8	1.21	15.1
Station 2 - Vantage Bridge	Barb Area B	8.1	1.15	13.8
Station 3 - SW Point	Barb Area B	8.8	1.23	18.1
Station 4 - Beam Dock (Area A)	Barb Area B	8.7	1.08	17.1
Station 5 - Water Dock (Area C)	Barb Area B	8.8	1.31	17.0
Station 6 - Active Drainage Area	Barb Area B	8.7	3.80	18.4
Station 7 - Sewer Unloading Area	Barb Area B	8.8	1.85	18.4
10/21/02				
Station 1 - Pedestrian Bridge	Barb Area C	10.8	1.17	11.7
Station 2 - Vantage Bridge	Barb Area C	10.4	1.11	11.7
Station 3 - SW Point	Barb Area C	8.8	1.18	15.8
Station 4 - Beam Dock (Area A)	Barb Area C	8.8	1.13	15.8
Station 5 - Water Dock (Area C)	Barb Area C	8.8	1.41	15.8
Station 6 - Active Drainage Area	Barb Area C	8.8	2.71	15.5
Station 7 - Sewer Unloading Area	Barb Area C	8.8	1.81	13.5
10/28/02				
Station 1 - Pedestrian Bridge	May Creek Delta	11.0	1.13	10.0
Station 2 - Vantage Bridge	May Creek Delta	10.1	1.10	10.1
Station 3 - SW Point	May Creek Delta	1.5	1.74	14.2
Station 4 - Beam Dock (Area A)	May Creek Delta	8.8	1.86	14.2
Station 5 - Water Dock (Area C)	May Creek Delta	9.8	1.39	14.1
Station 6 - Active Drainage Area	May Creek Delta	8.8	1.88	15.0
Station 7 - Sewer Unloading Area	May Creek Delta	8.8	2.19	14.3

5 SEDIMENT QUALITY PERFORMANCE MONITORING

As discussed above, Manson targeted a wood waste level of less than 50 percent in dredged materials removed from the site as an initial indication of when cleanup had been completed within a given operation area. Shortly after this initial performance standard was achieved throughout Area A (mid August) and Areas B/C (late October), sediment quality performance monitoring was conducted to verify that the site-specific sediment cleanup levels discussed in Section 3.2 had been achieved. All performance monitoring was performed by Anchor Environmental, LLC ("Anchor") following Ecology-approved procedures (Adolphson 2002, Anchor 2002).

Performance monitoring involved sampling all 16 baseline stations that previously exceeded site-specific cleanup levels for TOC and/or wood waste (Anchor 2002), along with two additional stations (BMPD-22 and BMPD-23) located immediately offshore of the dredge area. Sediment could not be recovered from the most inshore sampling station (BMPD-17; located immediately adjacent to shoreline structures), even after repeated attempts in the general sampling area. Thus, a total of 17 post-dredge confirmation samples were collected on approximate 125-foot centers, as depicted on Figure 2. Surface sediment samples (0 to 10 cm) representative of the final dredged surface were collected with a 0.1-m² modified stainless steel van Veen grab sampler, consistent with the baseline sampling program and current PSEP protocols.

Each post-dredge performance monitoring sediment sample was visually inspected to determine the volumetric percentage of wood waste, and was also submitted to Analytical Resources, Inc. (Seattle, WA) for analysis of TOC and other parameters using current PSEP methods. Performance monitoring data are summarized in Table 2; field logs and laboratory certificates are provided in Appendix A.

Data received from the analytical laboratory were reviewed for accuracy, precision, and compliance with overall quality assurance objectives. Field replicates and laboratory duplicates were collected and analyzed, and were within acceptable limits. The laboratory analyzed matrix spike and matrix spike duplicates, which were also within acceptable quality criteria.

Maximum post-dredge concentrations of TOC (13 percent) and wood waste (35 percent) detected at the site were well below the site-specific cleanup action levels (Table 2). Thus, detailed statistical analyses were not needed, as described in Section 3.2 above. The post-dredge sediment quality performance monitoring clearly verified that the dredging action achieved site-specific sediment cleanup levels throughout the 5.8-acre action area. Based on this analysis, and consistent with Ecology direction, no further sediment remedial action is required at the Barbee Mill facility (i.e., sediment cleanup was successful).

Table 2
Summary of Post-Dredge Performance Monitoring Results

Wash. State Plane NAD 27 N.			Date Sampled	Time Sampled	Water Depth (ft)	Penetration Depth (cm)	Sample Interval (cm)	TOC (%)	Volume Wood (%) ¹
Station ID	Northing	Easting							
Site-Specific Sediment Cleanup Standard (average concentration)								13.5	50
Maximum Allowable Concentration								15.9	75
BMPD-1	196,641.12	1,661,139.14	10/29/02	1100	18.0	17	0-10	8.3	<5
BMPD-2	196,641.12	1,661,264.14	10/29/02	1120	18.9	15	0-10	13.0	35
BMPD-5	196,591.12	1,661,139.14	10/29/02	1130	18.2	17	0-10	5.8	<5
BMPD-7	196,591.12	1,661,264.14	10/29/02	1200	12.7	19	0-10	4.9	10
BMPD-9	196,466.12	1,661,139.14	10/29/02	1245	14.5	18	0-10	5.7	10
BMPD-10	196,466.12	1,661,264.14	10/29/02	1300	12.5	17	0-10	6.4	10
BMPD-11	196,341.12	1,661,014.14	10/29/02	1345	19.1	18	0-10	3.5	5
BMPD-12	196,341.12	1,661,139.14	10/29/02	1355	14.0	17	0-10	6.0	25
BMPD-13	196,341.12	1,661,264.14	10/29/02	1414	12.3	18	0-10	7.3	25
BMPD-13R ^b	196,341.12	1,661,264.14	10/29/02	1430	12.1	17	0-10	6.8	25
BMPD-14	195,216.12	1,661,014.14	10/29/02	1450	18.8	19	0-10	6.0	10
BMPD-15	196,216.12	1,661,139.14	8/21/02	1100	NA	13	0-10	5.5	<5
BMPD-16	196,216.12	1,661,264.14	8/21/02	1110	NA	15	0-10	2.3	<5
BMPD-17 ^c	196,216.12	1,661,389.14	8/21/02	NA	NA	0	0	NA	NA
BMPD-19	196,091.12	1,661,139.14	8/21/02	1250	NA	15	0-10	6.2	<5
BMPD-20	196,093.32	1,661,376.16	8/21/02	1255	NA	13	0-10	7.7	15
BMPD-21	195,986.12	1,661,389.14	8/21/02	1135	NA	16	0-10	4.1	<5
BMPD-22	196,341.12	1,660,889.14	10/29/02	1330	22.0	17	0-10	7.3	25
BMPD-23	196,216.12	1,660,889.14	10/29/02	1440	22.8	16	0-10	5.6	<5

Notes:

¹ - Volumetric wood percentage based on visual estimation following homogenization of the upper 10 cm of the surface sample.

^b - Field quality assurance sample. Sample collected in location collocated to AMSM-13 (i.e., replicate sample).

^c - Sample could not be collected due to insufficient sediment material from the location following several attempts.

6 DISPOSAL AND BENEFICIAL REUSE OF DREDGED SEDIMENTS

As discussed in Section 4.1 above, approximately 20,000 cy of sediments dredged during the 2002 remedial action were transported to adjacent uplands for passive dewatering. Once the materials (sand/gravel or bark/wood debris) were sufficiently dewatered for handling, the dredge spoils were excavated and trucked from the shoreline to upland stockpile areas on the Barbee facility property. The sediment stockpiling area also included approximately 6,000 cy of materials from the previous 1999 interim remedial action (Lloyd 1999). Characterization of all dredged materials (approximately 26,000 cy total) for disposal or potential beneficial reuse is discussed below.

6.1 Stockpile Tracking, Sampling, and Analysis Methods

Previous sampling of the initial (1999) 6,000 cy bark/sediment stockpile indicated that the concentrations of total carcinogenic polynuclear aromatic hydrocarbons ("CPAHs") within this interim remedial action stockpile were likely below the MTCA unrestricted land use criterion of 0.14 milligrams per kilogram (mg/kg; dry weight basis; Lloyd 1999). However, due to CPAH detection limit and sample variability issues, the previous data did not support a definitive comparison with this MTCA criterion. All other chemical constituents, including metals, total petroleum hydrocarbons (NWTPH-Dx), and other semivolatile organics in the dredged and/or stockpiled materials were below cleanup levels for unrestricted use of the material (ReTec 1997, Lloyd 1999, Anchor 2002).

In order to characterize current CPAH concentrations within the interim remedial action (1999) stockpile, incorporating anticipated biodegradation of CPAHs within the stored bark/sediment stockpile over the 1999 to 2002 period, Barbee Mill resampled the interim remedial action sediment stockpile during summer 2002, and used the results to verify suitability of these 6,000 cy of material for disposal and/or beneficial reuse. An equivalent sampling methodology was also used to characterize the 20,000 cy of sediments dredged during the 2002 remedial action. The overall stockpile sampling methodology, as approved by Ecology (Sato 2002), consisted of the following:

- As discussed above, dredged materials were initially transferred from a scow to the temporary nearshore dewatering/storage area. As soon as dredged materials were sufficiently dewatered, they were sampled and then moved to the upland stockpile area. The origin and location of each stockpile was recorded on a site map.

Stockpiles were segregated during cleanup operations to prevent mixing. In addition, sands and gravels from the May Creek Delta were moved to the facility parking lot, while bark and wood debris were staged adjacent to the chip bunker behind straw bales until analytical data were available.

- Composite samples of each stockpile were prepared from equal volumes of material obtained from 10 to 20 representative vertical sections advanced either by hand with a clean shovel, or with an excavator (for larger stockpiles), at randomly selected locations within each stockpile. Each vertical section was sampled throughout the depth of the bark/sediment, and material collected from the surface to the bottom of the stockpile. Occasionally, composite samples of dredged materials were collected directly as the dredge scows were unloaded.
- Two (2) representative samples were collected and analyzed from the 6,000 cy interim remedial action (1999) stockpile (Samples BA-14 and BA-15, plus replicates). Chemical analyses of stockpiles generated by the 2002 remedial action dredging occurred at a frequency of approximately 1 analysis for every 500 to 1,000 cy of material, or 24 analyses for 20,000 cy of material (Samples BA-16 through BA-40). Thus, a total of 26 chemical determinations (plus replicates) of stockpiled materials were performed during summer/fall 2002.
- Each composite sample was mixed thoroughly prior to sub-sampling for chemical analysis. The samples were analyzed for CPAHs using low detection limit single ion monitoring ("SIM") analysis by Analytical Resources, Inc (Seattle, WA). Data received from the analytical laboratory were reviewed for accuracy, precision, and compliance with overall quality assurance objectives. Field replicates and laboratory duplicates were collected and analyzed, and were within acceptable limits. Duplicate and replicate data (when available) were averaged to characterize overall chemical quality of individual stockpiles. The laboratory analyzed matrix spike and matrix spike duplicates, which were also within acceptable quality criteria.
- The analytical results for CPAHs were evaluated using the toxicity equivalent concentration ("TEC") procedure as generally described in Ecology's MTCA/CLARC Publication 94-145 (updated November 2001). If the total TEC concentration for CPAHs in the composite soil sample was below 0.14 mg/kg, the material within that stockpile was deemed suitable for unrestricted beneficial reuse at on- or off-site locations. Conversely, stockpiles exceeding the 0.14 mg/kg criterion will be disposed or

treated at an approved off-site landfill facility. As discussed below, stockpiles of materials that exceeded 0.14 mg/kg were segregated from materials with CPAH concentrations less than this beneficial reuse criterion.

6.2 Sediment Stockpile Characterization Data

Barbee Mill sediment stockpile characterization data collected during 2002 are presented in Tables 3 and 4. The results of these determinations are summarized as follows:

- All 7 composite samples collected in 2002 of material dredged from Area A (see Figure 1), including the 6,000 cy interim remedial action (1999) stockpile, met the unrestricted beneficial reuse criterion (Table 3). As discussed by Lloyd (1999), a relatively small volume of sediments dredged in 1999 immediately adjacent to the shoreline oil/water separator (Sample BA-13), which contained elevated concentrations of motor oils and/or hydraulic oils, was previously segregated from the rest of the Area A material, transported to an approved off-site facility, and incinerated. Thus, all current Area A stockpiles at the Barbee Mill facility are suitable for unrestricted beneficial reuse at on- or off-site locations.
- Four (4) of the 15 composite samples collected in 2002 from material dredged from Area B exceeded the 0.14 mg/kg criterion for CPAHs (Table 4). The other 11 samples met the unrestricted beneficial reuse criterion (Table 3). Thus, approximately 73 percent of the Area B volume is suitable for unrestricted beneficial reuse at on- or off-site locations.
- Three (3) of the 4 composite samples collected in 2002 from material dredged from Area C exceeded the 0.14 mg/kg criterion for CPAHs (Table 4). The fourth sample met the unrestricted beneficial reuse criterion (Table 3). Thus, approximately 25 percent of the Area C volume is suitable for unrestricted beneficial reuse at on- or off-site locations.

Sediment samples that contained elevated cPAH concentrations (above 0.14 mg/kg) also exhibited visible burnt wood embers and chips. These observations, as well as the observed (pre-cleanup) pattern of elevated CPAH concentrations in areas closest to the former sawmill (i.e., Area C), suggest that the source of cPAH compounds detected in these sediments is likely attributable to an historical fire that occurred during the mid 1950's, which destroyed much of the former sawmill.

6.3 Final Disposition of Stockpiled Materials

As discussed above, dredging for the removal of bark and wood debris at the Barbee Mill facility was successfully completed in late October 2002. Sampling and analysis data indicates that the majority of the stockpiled sediments from this action (sand/gravel and bark/wood debris) are substantially below MTCA Method B criteria for unrestricted beneficial reuse at on- or off-site locations. Sediments that are suitable for unrestricted beneficial reuse (approximately 18,000 cy total, including 1999 interim action material; Table 3) are currently stored in a secure upland location at the facility, pending final disposition (sale, transfer off-site, or reuse on-site).

Sediments exceeding the MTCA Method B CPAH criterion for unrestricted beneficial reuse (approximately 8,000 cy total; Table 4) were initially stockpiled in a separate and secure upland location at the facility. All of these materials are currently being transferred to the Olympic View Sanitary Landfill in Kitsap County, Washington.

Based on the results of the cleanup action as described herein, the Barbee Mill Company requests a No Further Action determination letter from Ecology for sediments offshore of the Barbee facility.

Table 3
Barbee Mill Sediment Stockpile Data: 2002 Characterization

Parameter (mg/kg dry wt)	B[a]P Eq. Factors	BA-14 (as BAP eq.)		BA-15 (as BAP eq.)		BA-15-1 (Lab Dup.) (as BAP eq.)		BA-15-2 (Field Rep.) (as BAP eq.)		BA-16 (as BAP eq.)	
PAH's by Single Ion Monitoring (SIM)		Bark Area A									
Naphthalene	--	0.046	--	0.029 U	--	0.007 J	--	0.012	--	0.008 U	--
2-Methylnaphthalene	--	0.033	--	0.029 U	--	0.007 J	--	0.009	--	0.008 U	--
Acenaphthylene	--	0.034 U	--	0.029 U	--	0.010 U	--	0.006 J	--	0.008 U	--
Acenaphthene	--	0.080	--	0.029 U	--	0.012	--	0.016	--	0.007 MJ	--
Fluorene	--	0.086	--	0.086	--	0.010	--	0.016	--	0.007 MJ	--
Phenanthrene	--	0.320	--	0.092	--	0.051	--	0.092	--	0.029	--
Anthracene	--	0.063	--	0.038	--	0.017	--	0.016	--	0.008 MJ	--
Fluoranthene	--	0.280 M	--	0.490	--	0.092	--	0.018	--	0.057 M	--
Pyrene	--	0.240 M	--	0.370	--	0.058	--	0.110	--	0.018 M	--
Benzo(a)anthracene**	0.10	0.076 M	0.008 M	0.160	0.016	0.037	0.004	0.036	0.004	0.023 M	0.002 M
Chrysene**	0.01	0.096 M	0.001 M	0.190	0.002	0.066	0.001	0.060	0.001	0.018 M	0.000 M
Benzo(b)fluoranthene**	0.10	0.160 M	0.016 M	0.140	0.014	0.093	0.009	0.061	0.008	0.015 M	0.002 M
Benzo(k)fluoranthene**	0.10	0.110 M	0.011 M	0.110	0.011	0.079	0.008	0.044	0.004	0.012 M	0.001 M
Benzo(a)pyrene (B[a]P)**	1.00	0.080	0.080	0.092	0.092	0.069	0.069	0.050	0.050	0.012 M	0.012 M
Indeno(1,2,3-cd)pyrene**	0.10	0.060	0.006	0.064	0.006	0.008 J	0.001 J	0.020	0.002 J	0.008 U	0.001
Dibenz(a,h)anthracene**	0.40	0.020 MJ	0.008 MJ	0.023 J	0.009 J	0.010 U	0.002 U	0.008 J	0.003 J	0.008 U	0.002 U
Benzo(g,h,i)perylene	--	0.070 M	--	0.072	--	0.010	--	0.025	--	0.008 M	--
Dibenzofuran	--	0.050	--	0.028 U	--	0.010 U	--	0.010	--	0.008 U	--
Total cPAH (Method B = 0.14 mg/kg)			0.130	--	0.161	--	0.093	--	0.070	--	0.020
Total Organic Carbon (% of dry wt)			7.3	--	4.4	--	--	--	5.5	--	3.4
Total Solids (% of wet wt)			58.7	--	67.0	--	--	--	78.8	--	83.0

M = Poor spectral match

J = estimated quantity below PQL

U = solution

0.130	Total cPAH concentration (as B[a]P equivalent) is below MTCA Method B unrestricted beneficial reuse criterion
0.161	Exceedance of MTCA Method B unrestricted beneficial reuse criterion not confirmed in sample duplicates/replicates
All material stockpiles represented by these data are suitable for unrestricted beneficial reuse (see text).	

Table 3
Barbee Mill Sediment Stockpile Data: 2002 Characterization

Parameter (mg/kg dry wt)	B(a)P Eq. Factors	BA-17 (as B[a]P eq.)		BA-18 (as B[a]P eq.)		BA-19 (as B[a]P eq.)		BA-20 (as B[a]P eq.)		BB-21 (as B[a]P eq.)	
PAH's by Single Ion Monitoring (SIM)		Bark Area A								Bark Area B	
Naphthalene	--	0.009 U	--	0.012 U	--	0.005 J	--	0.009 U	--	0.008 J	--
2-Methylnaphthalene	--	0.009 U	--	0.012 U	--	0.010 U	--	0.009 U	--	0.011 U	--
Acenaphthylene	--	0.009 U	--	0.012 U	--	0.010 U	--	0.009 J	--	0.011 U	--
Acenaphthene	--	0.011	--	0.014 M	--	0.010 U	--	0.012	--	0.009 J	--
Fluorene	--	0.008 J	--	0.012	--	0.007 J	--	0.015	--	0.006 J	--
Phenanthrene	--	0.049	--	0.049	--	0.045	--	0.081	--	0.035	--
Anthracene	--	0.011	--	0.011 J	--	0.008 J	--	0.024	--	0.008 J	--
Fluoranthene	--	0.096	--	0.074	--	0.071	--	0.140	--	0.037	--
Pyrene	--	0.068	--	0.049	--	0.057	--	0.086	--	0.034	--
Benzo(a)anthracene**	0.10	0.022	0.002	0.026	0.003	0.026	0.003	0.035	0.004	0.019	0.002
Chrysene**	0.01	0.032	0.000	0.058	0.001	0.037	0.000	0.120	0.001	0.032	0.000
Benzo(b)fluoranthene**	0.10	0.038	0.004	0.053	0.005	0.040	0.004	0.054	0.005	0.034	0.003
Benzo(k)fluoranthene**	0.10	0.027	0.003	0.036	0.004	0.028	0.003	0.055	0.006	0.025	0.003
Benzo(a)pyrene (B[a]P)**	1.00	0.028	0.028	0.041	0.041	0.034	0.034	0.045	0.045	0.031	0.031
Indeno(1,2,3-cd)pyrene**	0.10	0.006 J	0.001 J	0.016	0.002	0.012	0.001	0.012	0.001	0.028	0.003
Dibenz(a,h)anthracene**	0.40	0.009 U	0.002 U	0.012 U	0.002 U	0.010 U	0.002 U	0.009 U	0.002 U	0.008 J	0.003
Benzo(g,h,i)perylene	--	0.0086 J	--	0.02 M	--	0.013	--	0.016	--	0.014	--
Dibenzofuran	--	0.0056 J	--	0.006 J	--	0.010 U	--	0.009 U	--	0.011 U	--
Total cPAH (Method B = 0.14 mg/kg)		--	0.039	--	0.067	--	0.047	--	0.064	--	0.045
Total Organic Carbon (% of dry wt)		3.8	--	4.4	--	5.5	--	3.5	--	2.6	--
Total Solids (% of wet wt)		72.5	--	53.1	--	67.7	--	81.8	--	62.7	--

M = Poor spectral match
J = estimated quantity below PQL
D = dilution

0.039 Total cPAH concentration (as B[a]P equivalent) is below MTCA Method B unrestricted beneficial reuse criterion. All material stockpiles represented by these data are suitable for unrestricted beneficial reuse (see text).

Table 3
Barbee Mill Sediment Stockpile Data: 2002 Characterization

Parameter (mg/kg dry wt)	B[a]P Eq. Factors	BB-23	(as BAP eq.)	BB-24	(as BAP eq.)	BB-26	(as BAP eq.)	BB-26-1 (Resample of BB-26)	BB-27	(as BAP eq.)	
PAH's by Single Ion Monitoring (SIM)		Bark Area B									
Naphthalene	--	0.079	--	0.020	--	0.020	--	0.009 U	--	0.010 U	--
2-Methylnaphthalene	--	0.018	--	0.010 U	--	0.008 U	--	0.008 U	--	0.010 U	--
Acenaphthylene	--	0.009 U	--	0.010 U	--	0.009	--	0.009 U	--	0.010 U	--
Acenaphthene	--	0.013	--	0.010	--	0.009	--	0.009 U	--	0.010 U	--
Fluorene	--	0.007 J	--	0.010 U	--	0.008	--	0.009 U	--	0.010 U	--
Phenanthrene	--	0.023	--	0.044	--	0.068	--	0.034	--	0.017	--
Anthracene	--	0.009 U	--	0.012	--	0.013	--	0.005 J	--	0.010 U	--
Fluoranthene	--	0.022	--	0.054	--	0.067	--	0.040	--	0.031	--
Pyrene	--	0.022	--	0.048	--	0.059	--	0.046	--	0.036	--
Benzo(a)anthracene**	0.10	0.062	0.006	0.030	0.003	0.036	0.004	0.020	0.002	0.028	0.003
Chrysene**	0.01	0.031	0.000	0.070	0.001	0.063	0.001	0.044	0.000	0.031	0.000
Benzo(b)fluoranthene**	0.10	0.044	0.004	0.097	0.010	0.100	0.010	0.061	0.006	0.045	0.005
Benzo(k)fluoranthene**	0.10	0.028	0.003	0.068	0.007	0.096	0.010	0.042	0.004	0.038	0.004
Benzo(a)pyrene (B[a]P)**	1.00	0.031	0.031	0.091	0.091	0.092	0.092	0.050	0.050	0.040	0.040
Indeno(1,2,3-cd)pyrene**	0.10	0.028	0.003	0.059	0.006	0.065	0.007	0.034	0.003	0.024	0.002
Dibenz(a,h)anthracene**	0.40	0.009	0.004	0.022	0.009	0.020	0.008	0.008 J	0.003 J	0.010 U	0.002 U
Benzo(g,h,i)perylene	--	0.031	--	0.088	--	0.086	--	0.046	--	0.029	--
Dibenzofuran	--	0.006 J	--	0.010 U	--	0.009 U	--	0.009 U	--	0.010 U	--
Total cPAH (Method B = 0.14 mg/kg)		--	0.051	--	0.126	--	0.130	--	0.069	--	0.056
Total Organic Carbon (% of dry wt)		3.6	--	3.5	--	3.1	--	3.0	--	2.7	--
Total Solids (% of wet wt)		70.0	--	67.0	--	77.4	--	74.0	--	67.8	--

M = Poor spectral match

J = estimated quantity below PQL

D = dilution

0.051

Total cPAH concentration (as B[a]P equivalent) is below MTCA Method B unrestricted beneficial reuse criterion. All material stockpiles represented by these data are suitable for unrestricted beneficial reuse (see text).

Table 3
Barbee Mill Sediment Stockpile Data: 2002 Characterization

Parameter (mg/kg dry wt)	B[a]P Eq. Factors	BB-28 (as B[a]P eq.)		BB-29 (as B[a]P eq.)		BB-31 (as B[a]P eq.)		BB-33 (as B[a]P eq.)		BB-35 (as B[a]P eq.)	
PAH's by Single Ion Monitoring (SIM)		Bark Area B									
Naphthalene	--	0.010 U	--	0.009 U	--	0.010 U	--	0.010 U	--	0.010 U	--
2-Methylnaphthalene	--	0.010 U	--	0.009 U	--	0.010 U	--	0.010 U	--	0.010 U	--
Acenaphthylene	--	0.010 U	--	0.009 U	--	0.010 U	--	0.010 U	--	0.010 U	--
Acenaphthene	--	0.010 U	--	0.009 U	--	0.010 U	--	0.010 U	--	0.010 U	--
Fluorene	--	0.010 U	--	0.009 U	--	0.010 U	--	0.010 U	--	0.010 U	--
Phenanthrene	--	0.012	--	0.038	--	0.010	--	0.022	--	0.027	--
Anthracene	--	0.010 U	--	0.009 U	--	0.010 U	--	0.010 U	--	0.010	--
Fluoranthene	--	0.019	--	0.049	--	0.020	--	0.037	--	0.039	--
Pyrene	--	0.026	--	0.050	--	0.020	--	0.046	--	0.046	--
Benzo(a)anthracene**	0.10	0.020	0.002	0.030	0.003	0.015	0.002	0.030	0.003	0.025	0.003
Chrysene**	0.01	0.062	0.001	0.062	0.001	0.027	0.000	0.070	0.001	0.054	0.001
Benzo(b)fluoranthene**	0.10	0.097	0.010	0.084	0.008	0.048	0.005	0.083	0.008	0.071	0.007
Benzo(k)fluoranthene**	0.10	0.060	0.006	0.081	0.008	0.026	0.003	0.073	0.007	0.046	0.005
Benzo(a)pyrene (B[a]P)**	1.00	0.092	0.092	0.078	0.078	0.037	0.037	0.087	0.087	0.057	0.057
Indeno(1,2,3-cd)pyrene**	0.10	0.076	0.008	0.058	0.006	0.026	0.003	0.061	0.006	0.029	0.003
Dibenz(a,h)anthracene**	0.40	0.021	0.008	0.014	0.006	0.010	0.004	0.023	0.009	0.010	0.004
Benzo(g,h,i)perylene	--	0.110	--	0.076	--	0.039	--	0.091	--	0.034	--
Dibenzofuran	--	0.010 U	--	0.009 U	--	0.010 U	--	0.010 U	--	0.010 U	--
Total cPAH (Method B = 0.14 mg/kg)		--	0.126	--	0.110	--	0.053	--	0.122	--	0.079
Total Organic Carbon (% of dry wt)		4.5	--	2.6	--	1.6	--	2.6	--	3.6	--
Total Solids (% of wet wt)		60.6	--	74.6	--	63.5	--	63.3	--	67.3	--

M = Poor spectral match

J = estimated quantity below PQL

D = dilution

0.126 Total cPAH concentration (as B[a]P equivalent) is below MTCA Method B unrestricted beneficial reuse criterion. All material stockpiles represented by these data are suitable for unrestricted beneficial reuse (see text).

Table 3
Barbee Mill Sediment Stockpile Data: 2002 Characterization

Parameter (mg/kg dry wt)	B[a]P Eq. Factors	BB-3B (as B[a]P eq.)		BC-3B (as B[a]P eq.)	
PAH's by Single Ion Monitoring (SIM)		Bark Area B		Bark Area C	
Naphthalene	--	0.013 U	--	0.010 U	--
2-Methylnaphthalene	--	0.013 U	--	0.010 U	--
Acenaphthylene	--	0.013 U	--	0.010 U	--
Acenaphthene	--	0.019	--	0.010 U	--
Fluorene	--	0.013 U	--	0.010 U	--
Phenanthrene	--	0.075	--	0.024	--
Anthracene	--	0.030	--	0.010 U	--
Fluoranthene	--	0.082	--	0.036	--
Pyrene	--	0.076	--	0.036	--
Benzo(a)anthracene**	0.10	0.033	0.003	0.026	0.003
Chrysene**	0.01	0.058	0.001	0.070	0.001
Benzo(b)fluoranthene**	0.10	0.047	0.005	0.110	0.011
Benzo(k)fluoranthene**	0.10	0.035	0.004	0.058	0.006
Benzo(a)pyrene (B[a]P)**	1.00	0.046	0.046	0.080	0.080
Indeno(1,2,3-cd)pyrene**	0.10	0.023	0.002	0.053	0.006
Dibenz(a,h)anthracene**	0.40	0.013 U	0.003 U	0.024	0.010
Benzo(g,h,i)perylene	--	0.029	--	0.078	--
Dibenzofuran	--	0.013 U	--	0.010 U	--
Total cPAH (Method B = 0.14 mg/kg)		--	0.063	--	0.115
Total Organic Carbon (% of dry wt)		4.0	--	3.0	--
Total Solids (% of wet wt)		49.3	--	62.5	--

M = Poor spectral match

J = estimated quantity below PQL

D = dilution

0.063

Total cPAH concentration (as B[a]P equivalent) is below MTCA Method B unrestricted beneficial reuse criterion. All material stockpiles represented by these data are suitable for unrestricted beneficial reuse (see text).

Table 4
Barber Sediment Offsite Disposal Samples

Parameter (mg/kg dry wt)	B[a]P Eq. Factor	BB-22 (as BAP eq.)		BB-25 (Resample of BB-22)		BB-30 (as BAP eq.)		BB-32 (as BAP eq.)		BB-34 (as BAP eq.)	
PAH's by Single Ion Monitoring (SIM)		Bark Area B									
Naphthalene	--	0.024	--	0.028	--	0.047 U	--	0.011 U	--	0.012 U	--
2-Methylnaphthalene	--	0.009 J	--	0.011 U	--	0.047 U	--	0.011 U	--	0.012 U	--
Acenaphthylene	--	0.009 J	--	0.013	--	0.047 U	--	0.011 U	--	0.012 U	--
Acenaphthene	--	0.016	--	0.013	--	0.047	--	0.011 U	--	0.021 U	--
Fluorene	--	0.016	--	0.011 U	--	0.120	--	0.011 U	--	0.012 U	--
Phenanthrene	--	0.086	--	0.067	--	0.270	--	0.052	--	0.021	--
Anthracene	--	0.021	--	0.020	--	0.970	--	0.015	--	0.012	--
Fluoranthene	--	0.130	--	0.100	--	0.240	--	0.066	--	0.043	--
Pyrene	--	0.100	--	0.096	--	0.280	--	0.066	--	0.049	--
Benzo(a)anthracene**	0.10	0.063	0.006	0.049	0.005	0.150	0.015	0.042	0.004	0.054	0.005
Chrysene**	0.01	0.120	0.001	0.100	0.001	0.460	0.005	0.099	0.001	0.140	0.001
Benzo(b)fluoranthene**	0.10	0.300	0.030	0.160	0.016	0.200	0.020	0.140	0.014	0.230	0.023
Benzo(k)fluoranthene**	0.10	0.220	0.022	0.120	0.012	0.150	0.015	0.110	0.011	0.120	0.012
Benzo(a)pyrene (B[a]P)**	1.00	0.170	0.170	0.140	0.140	0.180	0.180	0.140	0.140	0.230	0.230
Indeno(1,2,3-cd)pyrene**	0.10	0.140	0.014	0.047	0.005	0.110	0.011	0.091	0.009	0.130	0.013
Dibenz(a,h)anthracene**	0.40	0.044	0.018	0.014	0.006	0.047 U	0.009 U	0.034	0.014	0.049	0.020
Benzo(g,h,i)perylene	--	0.170	--	0.061	--	0.130	--	0.120	--	0.210	--
Dibenzofuran	--	0.008 J	--	0.011 U	--	0.047 U	--	0.011 U	--	0.012 U	--
Total cPAH (Method B = 0.14 mg/kg)		--	0.264	--	0.180	--	0.265	--	0.169	--	0.260
Total Organic Carbon (% of dry wt)		4.9	--	4.5	--	2.5	--	2.7	--	1.8	--
Total Solids (% of wet wt)		51.3	--	60.6	--	70.9	--	63.1	--	64.1	--

M = Poor spectral match

J = estimated quantity below PQL

D = dilution

0.264 Exceedance of MTCA Method B unrestricted beneficial reuse criterion indicated by sampling data
Materials transported to Olympic View Sanitary Landfill in Kitsap County, Washington

Table 4
Barber Sediment Offsite Disposal Samples

Parameter (mg/kg dry wt)	B[a]P Eq. Factors	BB-37 (as BAP eq.)		BC-39 (as BAP eq.)		BC-40 (as BAP eq.)	
PAH's by Single Ion Monitoring (SIM)		Bark Area C					
Naphthalene	--	0.011	--	0.011 U	--	0.020	--
2-Methylnaphthalene	--	0.011 U	--	0.011 U	--	0.028	--
Acenaphthylene	--	0.026	--	0.011 U	--	0.016	--
Acenaphthene	--	0.028	--	0.011 U	--	0.032	--
Fluorene	--	0.034	--	0.011 U	--	0.029	--
Phenanthrene	--	0.280	--	0.044	--	0.180	--
Anthracene	--	0.078	--	0.017	--	0.065	--
Fluoranthene	--	0.330	--	0.074	--	0.230	--
Pyrene	--	0.220	--	0.068	--	0.180	--
Benzo(a)anthracene**	0.10	0.110	0.011	0.052	0.005	0.130	0.013
Chrysene**	0.01	0.200	0.002	0.110	0.001	0.260	0.003
Benzo(b)fluoranthene**	0.10	0.240	0.024	0.180	0.018	0.380	0.038
Benzo(k)fluoranthene**	0.10	0.210	0.021	0.120	0.012	0.240	0.024
Benzo(a)pyrene (B[a]P)**	1.00	0.280	0.280	0.150	0.150	0.390	0.390
Indeno(1,2,3-cd)pyrene**	0.10	0.120	0.012	0.098	0.010	0.170	0.017
Dibenz(a,h)anthracene**	0.40	0.056	0.022	0.044	0.018	0.081	0.032
Benzo(g,h,i)perylene	--	0.160	--	0.140	--	0.180	--
Dibenzofuran	--	0.014	--	0.011 U	--	0.020	--
Total cPAH (Method B = 0.14 mg/kg)		--	0.372	--	0.214	--	0.517
Total Organic Carbon (% of dry wt)		4.3	--	2.9	--	3.3	--
Total Solids (% of wet wt)		56.5	--	60.1	--	53.8	--

M = Poor spectral match

J = estimated quantity below PQL

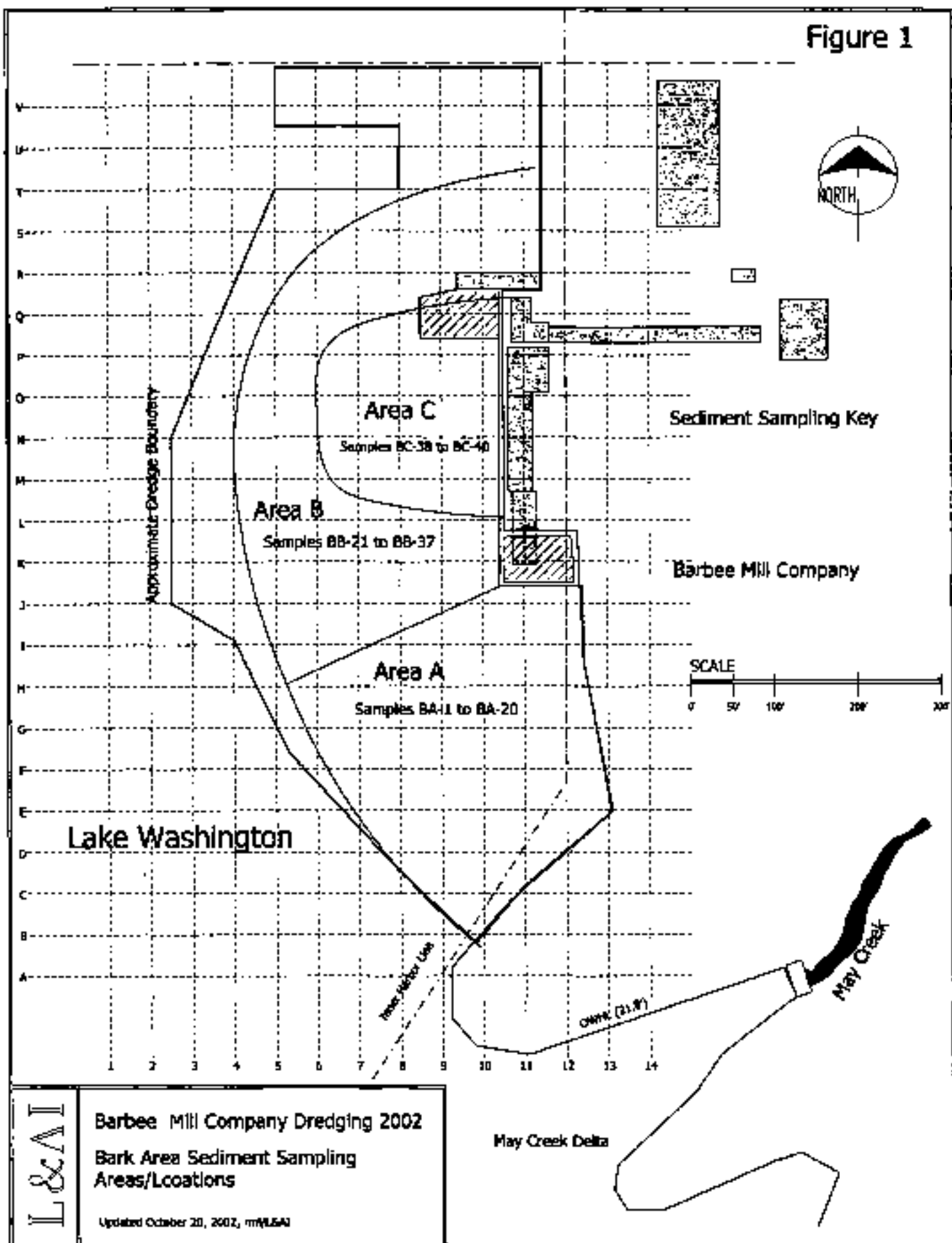
D = dilution

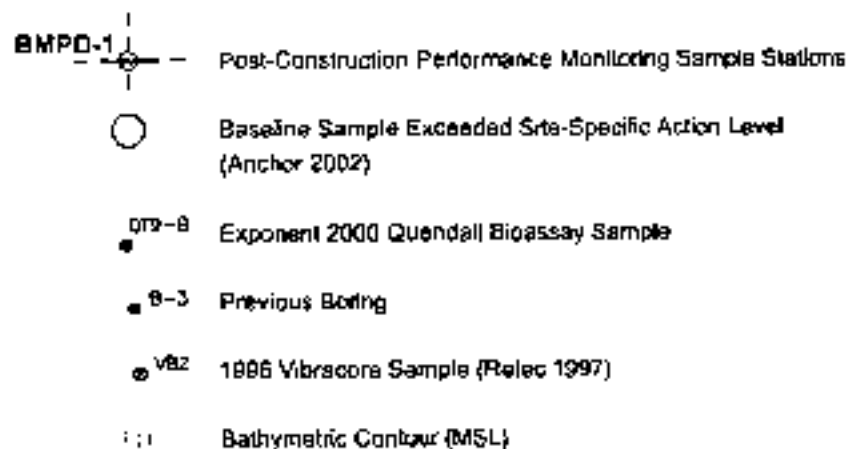
0.372 - Exceedance of MTCA Method B unrestricted beneficial reuse criterion indicated by sampling data
Materials transported to Olympic View Sanitary Landfill in Kitsap County, Washington

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Figure 1




ANCHOR
 ANCHOR HOLDINGS P.A.F. S.A.

APPENDIX A

**FIELD LOGS AND LABORATORY CERTIFICATES
POST-DREDGE MONITORING**



Surface Sediment Field Sample Record

Collection Date: 8/21/02
Shipping Date: 8/21/02Project Name: Bear Hills Project No: 020059-01 Station ID: BMPD-KSampling Crew: R. Barth & E. Parker
Sampling Vessel: Shoof Sampling Method: Van Veen
Subcontractor(s):
Station Coordinates: N / Lat. _____ Weather: Slightly Cloudy
E / W / Long. _____
Datum: NAD 83 / WGS 84 Zone: _____Sample Number: BMPD-K
Analysis: Metals / BMAs / VOCs / PCBs / Pest / Herb / TBTs / Diox-Furans
TS Grain Size DOC TVS / Ammonia / Sulfides
(Circle Appropriate Analyses)Field Test Results
Salinity: _____ ppt
Ammonia: _____ mg/L
Grain Size: _____ ml Coarse _____ ml Fines _____
Comments: _____Grab Number: 1 Water Depth: _____ Penetration/Sampled Depth: 0 Time: 1100

Biosay / Chemistry (circle) AVS/SEM: Total Sulfides: VOC Sample (circle)

Sediment Type:	Sediment Color:	Sediment Odor:
cobble	D.O.	none
gravel	gray	slight
sand C M F	black	moderate
silt clay	brown	strong
organic matter	brown surface	overwhelming

Comments: Large Stick
Agged Taws.
REJECTEDGrab Number: 2 Water Depth: _____ Penetration/Sampled Depth: 0 Time: 1100

Biosay / Chemistry (circle) AVS/SEM: Total Sulfides: VOC Sample (circle)

Sediment Type:	Sediment Color:	Sediment Odor:
cobble	D.O.	none
gravel	gray	slight
sand C M F	black	moderate
silt clay	brown	strong
organic matter	brown surface	overwhelming

Comments: Captured
small amount of
gravel (clean, gray)
REJECTEDGrab Number: 3 Water Depth: _____ Penetration/Sampled Depth: Ben / 10 Time: 1100

Biosay / Chemistry (circle) AVS/SEM: Total Sulfides: VOC Sample (circle)

Sediment Type:	Sediment Color:	Sediment Odor:
cobble	D.O.	none
gravel	gray	slight
sand C M F	black	moderate
silt clay	brown	strong
organic matter	brown surface	overwhelming

Comments: <5% Wood By
Slight winnowing. Some
small black chips but
not ubiquitous

Grab Number: _____ Water Depth: _____ Penetration/Sampled Depth: _____ Time: _____

Biosay / Chemistry (circle) AVS/SEM: Total Sulfides: VOC Sample (circle)

Sediment Type:	Sediment Color:	Sediment Odor:
cobble	D.O.	none
gravel	gray	slight
sand C M F	black	moderate
silt clay	brown	strong
organic matter	brown surface	overwhelming

Comments: _____

Recorded by: Ryan Barth 8/21/02



Surface Sediment Field Sample Record

Collection Date: 8/21/02
Shipping Date: 8/21/02

Project Name:

Project No: 020059-1

Station ID: BMPD-16

Sampling Crew: <u>R. Barth & E. Parker</u>	Sampling Method: <u>van Veen</u>
Sampling Vessel: <u>Shiff</u>	
Subcontractor(s):	
Station Coordinates: N / Lat: _____	Weather: <u>Slightly Cloudy</u>
E / W / Long: _____	
Date: <u>NAD 83 / WGS 84</u>	Zone: _____

Sample Number: BMPD-16

Analysis: Metals / BNAs / VOCs / PCBs / Pest / Herb / TBTs / Diac-Furans

☒ Grain Size ☒ TVS / Ammonia / Sulfides

(Circle Appropriate Analyses)

Field Test Results

Comments: _____

Salinity: _____ ppt

Ammonia: _____ mg/L

Grain Size: _____ ml Coarse: _____ ml Fine: _____

Grab Number: 1 Water Depth: _____ Penetration/Sampled Depth: 15/10 Time: 1110

Biosassay / Chemistry (circle) AVS/SEM: Total Sulfides; VOC Sample (circle)

Sediment Type:	Sediment Color:	Sediment Odor:
cobble	D.O.	none
gravel	gray	slight
sand C M F	black	moderate
silt clay	brown	strong
organic matter	brown surface	overwhelming

Comments: < 5% Wood By Volume. No wood chips present. No winnowing

Grab Number: _____ Water Depth: _____ Penetration/Sampled Depth: _____ Time: _____

Biosassay / Chemistry (circle) AVS/SEM: Total Sulfides; VOC Sample (circle)

Sediment Type:	Sediment Color:	Sediment Odor:
cobble	D.O.	none
gravel	gray	slight
sand C M F	black	moderate
silt clay	brown	strong
organic matter	brown surface	overwhelming

Comments: _____

Grab Number: _____ Water Depth: _____ Penetration/Sampled Depth: _____ Time: _____

Biosassay / Chemistry (circle) AVS/SEM: Total Sulfides; VOC Sample (circle)

Sediment Type:	Sediment Color:	Sediment Odor:
cobble	D.O.	none
gravel	gray	slight
sand C M F	black	moderate
silt clay	brown	strong
organic matter	brown surface	overwhelming

Comments: _____

Grab Number: _____ Water Depth: _____ Penetration/Sampled Depth: _____ Time: _____

Biosassay / Chemistry (circle) AVS/SEM: Total Sulfides; VOC Sample (circle)

Sediment Type:	Sediment Color:	Sediment Odor:
cobble	D.O.	none
gravel	gray	slight
sand C M F	black	moderate
silt clay	brown	strong
organic matter	brown surface	overwhelming

Comments: _____

Recorded by: Ryan Barth 8/21/02



Surface Sediment Field Sample Record

Collection Date: 8/31/02

Shipping Date: 8/31/02

Project Name: Barlow MillsProject No: 020059-1Station ID: BMPD-19Sampling Crew: P. Barth & E. ParkerSampling Vessel: SkiffSampling Method: van Veen

Subcontractor(s):

Station Coordinates: N / Lat.

Weather: Sunny

E / W / Long.

Datum: NAD 83 / WGS 84

Zone:

Sample Number: BMPD-19

Analysis: Metals / BNAs / VOCs / PCBs / Pest / Herb / TBTs / Dix-Furans

TS Grain Size / VOC / TVS / Ammonia / Sulfides

(Circle Appropriate Analyses)

Field Test Results

Comments:

Salinity: _____ ppt

Ammonia: _____ mg/L

Grain Size: _____ ml Coarse: _____ ml Fine: _____

Grab Number: 1

Water Depth: _____

Penetration/Sampled Depth: 15/10 cmTime: 1250

Bioassay / Chemistry (circle)

AVS/SEM: Total Sulfides: VOC Sample (circle)

Sediment Type:

Sediment Color:

Sediment Odor:

Comments: <5% Wood Waste by Volume. No winnowing.

cobble

D.O.

none

H₂S

gravel

gray

slight

Petroleum

SDOC ME gray sand sublain by organic

black

moderate

other:

silt clay

brown

strong

No Shells

organic matter

brown surface

overwhelming

Grab Number: _____

Water Depth: _____

Penetration/Sampled Depth: _____

Time: _____

Bioassay / Chemistry (circle)

AVS/SEM: Total Sulfides: VOC Sample (circle)

Sediment Type:

Sediment Color:

Sediment Odor:

Comments:

cobble

D.O.

none

H₂S

gravel

gray

slight

Petroleum

sand C M F

black

moderate

other:

silt clay

brown

strong

organic matter

brown surface

overwhelming

Grab Number: _____

Water Depth: _____

Penetration/Sampled Depth: _____

Time: _____

Bioassay / Chemistry (circle)

AVS/SEM: Total Sulfides: VOC Sample (circle)

Sediment Type:

Sediment Color:

Sediment Odor:

Comments:

cobble

D.O.

none

H₂S

gravel

gray

slight

Petroleum

sand C M F

black

moderate

other:

silt clay

brown

strong

organic matter

brown surface

overwhelming

Grab Number: _____

Water Depth: _____

Penetration/Sampled Depth: _____

Time: _____

Bioassay / Chemistry (circle)

AVS/SEM: Total Sulfides: VOC Sample (circle)

Sediment Type:

Sediment Color:

Sediment Odor:

Comments:

cobble

D.O.

none

H₂S

gravel

gray

slight

Petroleum

sand C M F

black

moderate

other:

silt clay

brown

strong

organic matter

brown surface

overwhelming

Recorded by: Ryan Barth

8/31/02



Surface Sediment Field Sample Record

Collection Date: 8/21/02

Shipping Date: 8/21/02

Project Name: Barlow MillsProject No: 020059-1Station ID: RMPD-20

Sampling Crew: R. Barth & E. Parker
Sampling Vessel: Skiff Sampling Method: Van Veen
Subcontractor(s):
Station Coordinates: N / Lat: _____ Weather: Sunny
E / W / Long: _____
Datum: NAD 83 / NGS 84 Zone: _____

Sample Number: RMPD-20
Analysis: Metals / BNAs / VOCs / PCBs / PAHs / HCB / TBTs / Diox-Furans
TS Grain Size VOC TVS / Ammonia / Sulfides
(Circle Appropriate Analyses)

Field Test Results

Salinity: _____ spt
Ammonia: _____ mg/L
Grain Size: ml Coarse: _____ ml Fines: _____
Comments: _____

Grab Number: 1 Water Depth: _____ Penetration/Sampled Depth: 0 Time: 1245
Biosassay / Chemistry (circle) AVS/SEM: Total Sulfides; VOC Sample (circle)

Sediment Type:	Sediment Color:	Sediment Odor:	Comments:
cobble	D.O.	none	jars clogged by long stick. REJECTED
gravel	gray	slight	
sand C M F	black	moderate	
silt clay	brown	strong	
organic matter	brown surface	overwhelming	

Grab Number: 2 Water Depth: _____ Penetration/Sampled Depth: 3/10cm Time: 1250
Biosassay / Chemistry (circle) AVS/SEM: Total Sulfides; VOC Sample (circle)

Sediment Type:	Sediment Color:	Sediment Odor:	Comments:
cobble	D.O.	none	~15% wood debris by volume. Some underlining.
gravel	gray	slight	
sand C M F	black	moderate	
silt clay	brown	strong	
organic matter	brown surface	overwhelming	

Brown Sand in organic matrix

Grab Number: _____ Water Depth: _____ Penetration/Sampled Depth: _____ Time: _____
Biosassay / Chemistry (circle) AVS/SEM: Total Sulfides; VOC Sample (circle)

Sediment Type:	Sediment Color:	Sediment Odor:	Comments:
cobble	D.O.	none	REJECTED
gravel	gray	slight	
sand C M F	black	moderate	
silt clay	brown	strong	
organic matter	brown surface	overwhelming	

Grab Number: _____ Water Depth: _____ Penetration/Sampled Depth: _____ Time: _____
Biosassay / Chemistry (circle) AVS/SEM: Total Sulfides; VOC Sample (circle)

Sediment Type:	Sediment Color:	Sediment Odor:	Comments:
cobble	D.O.	none	
gravel	gray	slight	
sand C M F	black	moderate	
silt clay	brown	strong	
organic matter	brown surface	overwhelming	

Recorded by: Ryan Barth 8/21/02



Surface Sediment Field Sample Record

Collection Date: 8/21/02

Shipping Date: 8/21/02

Project Name: Barber Hills

Project No: 020059-1

Station ID: BMFD-21

Sampling Crew: R. Barth & E. Parker

Sampling Vessel: Skiff

Sampling Method: Van Veen

Subcontractor(s):

Station Coordinates: N / Lat

Weather: Sunny

E / W / Long

Datum: NAD 83 / WGS 84

Zone

Sample Number: BMFD-21

Analysis: Metals / BNA's / VOC's / PCB's / Pest / Herb / TBT's / Dix-Furans

(S) Grain Size (T) TVS / Ammonia / Sulfides

(Circle Appropriate Analyses)

Field Test Results

Comments:

Salinity: _____ ppt

Ammonia: _____ mg/L

Grain Size: _____ ml Coarse: _____

ml Fines: _____

Grab Number: _____

Water Depth: _____

Penetration/Sampled Depth: 16/10cm

Time: 1135

Biosassay / Chemistry

(circle)

AVS/SEM; Total Sulfides; VOC Sample (circle)

Sediment Type:

Sediment Color:

Sediment Odor:

cobble

D.O.

none

H₂S

gravel

gray

slight

Petroleum

sand C M F

black

moderate

other:

silt clay

brown

strong

slight

organic matter

brown surface

overwhelming

shale

Comments: <5% Wood
by Volume. No unknown

Grab Number: _____

Water Depth: _____

Penetration/Sampled Depth: _____

Time: _____

Biosassay / Chemistry

(circle)

AVS/SEM; Total Sulfides; VOC Sample (circle)

Sediment Type:

Sediment Color:

Sediment Odor:

cobble

D.O.

none

H₂S

gravel

gray

slight

Petroleum

sand C M F

black

moderate

other:

silt clay

brown

strong

organic matter

brown surface

overwhelming

Grab Number: _____

Water Depth: _____

Penetration/Sampled Depth: _____

Time: _____

Biosassay / Chemistry

(circle)

AVS/SEM; Total Sulfides; VOC Sample (circle)

Sediment Type:

Sediment Color:

Sediment Odor:

cobble

D.O.

none

H₂S

gravel

gray

slight

Petroleum

sand C M F

black

moderate

other:

silt clay

brown

strong

organic matter

brown surface

overwhelming

Grab Number: _____

Water Depth: _____

Penetration/Sampled Depth: _____

Time: _____

Biosassay / Chemistry

(circle)

AVS/SEM; Total Sulfides; VOC Sample (circle)

Sediment Type:

Sediment Color:

Sediment Odor:

cobble

D.O.

none

H₂S

gravel

gray

slight

Petroleum

sand C M F

black

moderate

other:

silt clay

brown

strong

organic matter

brown surface

overwhelming

Recorded by:

Ryan Barth 8/21/02



Surface Sediment Field Sample Record

Collection Date: 10/23/02

Shipping Date: 10/28/02

Project Name: Baibie Mills

Project No: 020059-01 T3

Station ID: BMPD-01

Sampling Crew: R. Barth, E. Parker

Sampling Vessel: Shuff

Sampling Method: van Veen

Subcontractor(s):

Station Coordinates: N / Lat.

Weather:

E / W / Long.

Datum: NAD 83 / WGS 84

Zone:

Sample Number: BMPD-01

Analysis: Metals / BNAs / VOCs / PCBs / Pests / Herb / TBTs / Diox-Furans

TS / Grain Size / VOC / TVS / Ammonia / Sulfides

(Circle Appropriate Analyses)

Field Test Results

Comments:

Salinity: _____ ppt

Ammonia: _____ mg/L

Grain Size: _____ ml Coarse: _____

ml Fine: _____

Grab Number: 1

Water Depth: N.D.

Penetration/Sampled Depth: 0/6

Time: 1055

Bioassay / Chemistry (circle)

AVS/SEM; Total Sulfides; VOC Sample (circle)

Sediment Type:

Sediment Color:

Sediment Odor:

cobble

D.O.

none

H2S

gravel

gray

slight

Petroleum

sand C M F

black

moderate

other:

silt clay

brown

strong

organic matter

brown surface

overwhelming

Comments:

van Veen clogged w/ large wood debris. No sediment captured due to large chunks of wood

Grab Number: 2

Water Depth: N.D.

Penetration/Sampled Depth: 7cm/10cm

Time: 1100

Bioassay / Chemistry (circle)

AVS/SEM; Total Sulfides; VOC Sample (circle)

Sediment Type:

Sediment Color:

Sediment Odor:

cobble

D.O.

none

H2S

gravel

gray

slight

Petroleum

sand C M F

black

moderate

other:

silt clay

brown

strong

organic matter

brown surface

overwhelming

Comments:

45% wood by weight (visual est.)

Grab Number: _____

Water Depth: _____

Penetration/Sampled Depth: _____

Time: _____

Bioassay / Chemistry (circle)

AVS/SEM; Total Sulfides; VOC Sample (circle)

Sediment Type:

Sediment Color:

Sediment Odor:

cobble

D.O.

none

H2S

gravel

gray

slight

Petroleum

sand C M F

black

moderate

other:

silt clay

brown

strong

organic matter

brown surface

overwhelming

Comments:

Grab Number: _____

Water Depth: _____

Penetration/Sampled Depth: _____

Time: _____

Bioassay / Chemistry (circle)

AVS/SEM; Total Sulfides; VOC Sample (circle)

Sediment Type:

Sediment Color:

Sediment Odor:

cobble

D.O.

none

H2S

gravel

gray

slight

Petroleum

sand C M F

black

moderate

other:

silt clay

brown

strong

organic matter

brown surface

overwhelming

Comments:

Recorded by: Ryan Barth

Project Name: Barber Hills

Project No: 020059-01

T3

Station ID: BMPD-02

Sampling Crew: <u>R. Barth, E. Parker</u>	Sampling Method: <u>van Veen</u>
Sampling Vessel: <u>Skiff</u>	
Subcontractor(s):	
Station Coordinates: N / Lat. _____	Weather: _____
E / W / Long. _____	
Datum: <u>NAD 83 / WGS 84</u>	Zone: _____

Sample Number: BMPD-02

Analysis: Metals / BNAs / VOCs / PCBs / Pest / Herb / TBTs / Diox-Furans
TS / Grain Size / (OC) / TVS / Ammonia / Sulfides
 (Circle Appropriate Analyses)

Field Test Results	Comments: <u>Minor unearthing</u>
Salinity: _____ ppt	
Ammonia: _____ mg/L	
Grain Size: _____ ml Coarse: _____	ml Fines: _____

Grab Number: <u>1</u>	Water Depth: <u>16.9'</u>	Penetration/Sampled Depth: <u>15 / 10cm</u>	Time: <u>1120</u>
Bioassay / Chemistry (circle)	AVS/SEM; Total Sulfides; VOC Sample (circle)		
Sediment Type:	Sediment Color:	Sediment Odor:	Comments:
cobble	D.O.	none	<u>~35% wood by volume (small)</u> <u>probated of shear</u>
gravel	gray	slight	
sand C M F	black	moderate	
silt clay	brown	strong	
organic matter	brown surface	overwhelming	

Handwritten notes in column 1: No stratigraphy, Saw dark wood debris intermixed

Grab Number: <u>2</u>	Water Depth: _____	Penetration/Sampled Depth: _____	Time: _____
Bioassay / Chemistry (circle)	AVS/SEM; Total Sulfides; VOC Sample (circle)		
Sediment Type:	Sediment Color:	Sediment Odor:	Comments:
cobble	D.O.	none	<u>H2S</u> <u>Petroleum</u> <u>other:</u>
gravel	gray	slight	
sand C M F	black	moderate	
silt clay	brown	strong	
organic matter	brown surface	overwhelming	

Handwritten note: R. Barth

Grab Number: _____	Water Depth: _____	Penetration/Sampled Depth: _____	Time: _____
Bioassay / Chemistry (circle)	AVS/SEM; Total Sulfides; VOC Sample (circle)		
Sediment Type:	Sediment Color:	Sediment Odor:	Comments:
cobble	D.O.	none	<u>H2S</u> <u>Petroleum</u> <u>other:</u>
gravel	gray	slight	
sand C M F	black	moderate	
silt clay	brown	strong	
organic matter	brown surface	overwhelming	

Grab Number: _____	Water Depth: _____	Penetration/Sampled Depth: _____	Time: _____
Bioassay / Chemistry (circle)	AVS/SEM; Total Sulfides; VOC Sample (circle)		
Sediment Type:	Sediment Color:	Sediment Odor:	Comments:
cobble	D.O.	none	<u>H2S</u> <u>Petroleum</u> <u>other:</u>
gravel	gray	slight	
sand C M F	black	moderate	
silt clay	brown	strong	
organic matter	brown surface	overwhelming	

Recorded by: Ryan Barth



Surface Sediment Field Sample Record

Collection Date: 10/28/02

Shipping Date: 10/28/02

Project Name: Bucke Mills

Project No: 020059-01 T3 Station ID: BMPD-06

Sampling Crew: R. Barth, E. Parker

Sampling Vessel: Shiff

Sampling Method: Van Veen

Subcontractor(s):

Station Coordinates:

N / Lat.

Weather:

E / W / Long.

Datum: NAD 83 / WGS 84

Zone:

Sample Number: BMPD-06

Analysis: Metals / BAs / VOCs / PCBs / PAH / Herb / TBTs / Diox-Furans

☒ Grain Size / ☒ TVS / Ammonia / Sulfides

(Circle Appropriate Analyses)

Field Test Results

Comments:

Salinity: _____ ppt

Ammonia: _____ mg/L

Grain Size: _____ ml Coarse: _____

ml Fines: _____

Grab Number: 1 Water Depth: 18.2' Penetration/Sampled Depth: 1cm / 10cm Time: 1130

Bioassay / Chemistry (circle) AVS/SEM; Total Sulfides; VOC Sample (circle)

Sediment Type:	Sediment Color:	Sediment Odor:
cobble	D.O.	none H2S
gravel	gray	slight Petroleum
sand C M F	black	moderate other:
silt clay	brown	strong
organic matter	brown surface	overwhelming

Comments: 25% wood by volume (visual)
Sham throughout

Grab Number: _____ Water Depth: _____ Penetration/Sampled Depth: _____ Time: _____

Bioassay / Chemistry (circle) AVS/SEM; Total Sulfides; VOC Sample (circle)

Sediment Type:	Sediment Color:	Sediment Odor:
cobble	D.O.	none H2S
gravel	gray	slight Petroleum
sand C M F	black	moderate other:
silt clay	brown	strong
organic matter	brown surface	overwhelming

Comments:

Grab Number: _____ Water Depth: _____ Penetration/Sampled Depth: _____ Time: _____

Bioassay / Chemistry (circle) AVS/SEM; Total Sulfides; VOC Sample (circle)

Sediment Type:	Sediment Color:	Sediment Odor:
cobble	D.O.	none H2S
gravel	gray	slight Petroleum
sand C M F	black	moderate other:
silt clay	brown	strong
organic matter	brown surface	overwhelming

Comments:

Grab Number: _____ Water Depth: _____ Penetration/Sampled Depth: _____ Time: _____

Bioassay / Chemistry (circle) AVS/SEM; Total Sulfides; VOC Sample (circle)

Sediment Type:	Sediment Color:	Sediment Odor:
cobble	D.O.	none H2S
gravel	gray	slight Petroleum
sand C M F	black	moderate other:
silt clay	brown	strong
organic matter	brown surface	overwhelming

Comments:

Recorded by: _____



Surface Sediment Field Sample Record

Collection Date: 10/28/02

Shipping Date: 10/28/02

Project Name: Barba MillsProject No: 020039-01 T3Station ID: BMPD-07Sampling Crew: R. Barth, F. ParkerSampling Vessel: ShiffSampling Method: Van Veen

Subcontractor(s):

Station Coordinates: N/Lat. 47.53042

Weather:

E/W/Long. 122.20576Datum: NAD 83 / WGS 84

Zone:

Sample Number: BMPD-07

Analysis: Metals / BNAs / VOCs / PCBs / Pest / Herb / TBTs / Diox-Furans

TS / Grain Size / EC / TVS / Ammonia / Sulfides

(Circle Appropriate Analyses)

Field Test Results

Salinity: _____ ppt

Ammonia: _____ mg/L

Grain Size: _____ ml Coarse: _____

ml Fine: _____

Comments: Moved station approx. 5' south of proposed location so further from pier face.Grab Number: 1 Water Depth: 12.7' Penetration/Sampled Depth: 15cm/10cm Time: 1200

Bioassay / Chemistry (circle) AVS/SEM; Total Sulfides; VOC Sample (circle)

Sediment Type:

Sediment Color:

Sediment Odor:

cobble

D.O.

none

H₂S

gravel

gray

slight

Petroleum

sand C M F

black

moderate

other:

silt clay

brown

strong

organic matter

brown surface

overwhelming

Comments:

Van Veen jaws clogged w/ medium size wood chunks.Grab Number: 2 Water Depth: 12.7' Penetration/Sampled Depth: 17cm/10cm Time: 1200

Bioassay / Chemistry (circle) AVS/SEM; Total Sulfides; VOC Sample (circle)

Sediment Type:

Sediment Color:

Sediment Odor:

cobble

D.O.

none

H₂S

gravel

gray

slight

Petroleum

sand C M F

black

moderate

other:

silt clay

brown

strong

organic matter

brown surface

overwhelming

Comments:

~10% wood debris by volume.

Grab Number: _____ Water Depth: _____ Penetration/Sampled Depth: _____ Time: _____

Bioassay / Chemistry (circle) AVS/SEM; Total Sulfides; VOC Sample (circle)

Sediment Type:

Sediment Color:

Sediment Odor:

cobble

D.O.

none

H₂S

gravel

gray

slight

Petroleum

sand C M F

black

moderate

other:

silt clay

brown

strong

organic matter

brown surface

overwhelming

Comments:

Grab Number: _____ Water Depth: _____ Penetration/Sampled Depth: _____ Time: _____

Bioassay / Chemistry (circle) AVS/SEM; Total Sulfides; VOC Sample (circle)

Sediment Type:

Sediment Color:

Sediment Odor:

cobble

D.O.

none

H₂S

gravel

gray

slight

Petroleum

sand C M F

black

moderate

other:

silt clay

brown

strong

organic matter

brown surface

overwhelming

Comments:

Recorded by: Ryan Barth



Surface Sediment Field Sample Record

Collection Date: 10/24/02
Shipping Date: 10/29/02Project Name: Banbra MillsProject No: 020059-01 T3Station ID: BMPD-09Sampling Crew: R. Barth, E. ParkerSampling Vessel: SkiffSampling Method: van VanSubcontractor(s): NO

Station Coordinates: N / Lat. _____

Weather: _____

E / W / Long. _____

Datum: NAD 83 / WGS 84

Zone: _____

Sample Number: BMPD-09

Analysis: Metals / BNAs / VOCs / PCBs / Pest / Herb / TBTs / Diox-Furans

☒ Grain Size ☒ TOC ☐ VS / Ammonia / Sulfides

(Circle Appropriate Analyses)

Field Test Results

Comments: _____

Salinity: _____ ppt

Ammonia: _____ mg/L

Grain Size: ml Coarse: _____ ml Fines: _____

Grab Number: 1 Water Depth: 14.5' Penetration/Sampled Depth: 18cm / 10cm Time: 1245

Biosassay / Chemistry (circle) AVS/SEM: Total Sulfides; VOC Sample (circle)

Sediment Type:	Sediment Color:	Sediment Odor:
cobble	D.O.	none
gravel	gray	slight
sand C M F	black	moderate
silt clay	brown	strong
organic matter	brown surface	overwhelming

Comments: _____

~10% wood by volume (vertical)Grab Number: _____ Water Depth: _____ Penetration/Sampled Depth: _____ Time: _____
Biosassay / Chemistry (circle) AVS/SEM: Total Sulfides; VOC Sample (circle)

Sediment Type:	Sediment Color:	Sediment Odor:
cobble	D.O.	none
gravel	gray	slight
sand C M F	black	moderate
silt clay	brown	strong
organic matter	brown surface	overwhelming

Comments: _____

Grab Number: _____ Water Depth: _____ Penetration/Sampled Depth: _____ Time: _____
Biosassay / Chemistry (circle) AVS/SEM: Total Sulfides; VOC Sample (circle)

Sediment Type:	Sediment Color:	Sediment Odor:
cobble	D.O.	none
gravel	gray	slight
sand C M F	black	moderate
silt clay	brown	strong
organic matter	brown surface	overwhelming

Comments: _____

Grab Number: _____ Water Depth: _____ Penetration/Sampled Depth: _____ Time: _____
Biosassay / Chemistry (circle) AVS/SEM: Total Sulfides; VOC Sample (circle)

Sediment Type:	Sediment Color:	Sediment Odor:
cobble	D.O.	none
gravel	gray	slight
sand C M F	black	moderate
silt clay	brown	strong
organic matter	brown surface	overwhelming

Comments: _____

Recorded by: Ryan Barth



Surface Sediment Field Sample Record

Collection Date: 10/20/02

Shipping Date: 11/25/02

Project Name: Rancho Mills

Project No: 020059-01

Station ID: BMPD-10

Sampling Crew: R. Barth, E. Parker

Sampling Vessel: Shiff

Sampling Method: Van Veen

Subcontractor(s):

Station Coordinates: N / Lat.

Weather:

E / W / Long.

Datum: NAD 83 / WGS 84

Zone:

Sample Number: BMPD-10

Analysis: Metals / BNAs / VOCs / PCBs / Pestic / Herb / TBTs / Diox-Furans

TS / Grain Size / DOC / TVS / Ammonia / Sulfides

(Circle Appropriate Analyses)

Field Test Results

Comments:

Salinity: _____ ppt

Ammonia: _____ mg/L

Grain Size: ml Coarse: _____ ml Fines: _____

Grab Number: 1

Water Depth: 12.5'

Penetration/Sampled Depth: 17m/10m

Time: 1500

Biosassay / Chemistry (circle) AVS/SEM: Total Sulfides: VOC Sample (circle)

Sediment Type:

Sediment Color:

Sediment Odor:

cobble

D.O.

none

H2S

gravel

gray

slight

Petroleum

sand C M F

black

moderate

other:

silt clay

brown

strong

Shore

organic matter

brown surface

overwhelming

throughout

Comments:

~10% wood by volume (vertical).

Grab Number:

Water Depth:

Penetration/Sampled Depth:

Time:

Biosassay / Chemistry (circle) AVS/SEM: Total Sulfides: VOC Sample (circle)

Sediment Type:

Sediment Color:

Sediment Odor:

cobble

D.O.

none

H2S

gravel

gray

slight

Petroleum

sand C M F

black

moderate

other:

silt clay

brown

strong

Shore

organic matter

brown surface

overwhelming

throughout

Comments:

Grab Number:

Water Depth:

Penetration/Sampled Depth:

Time:

Biosassay / Chemistry (circle) AVS/SEM: Total Sulfides: VOC Sample (circle)

Sediment Type:

Sediment Color:

Sediment Odor:

cobble

D.O.

none

H2S

gravel

gray

slight

Petroleum

sand C M F

black

moderate

other:

silt clay

brown

strong

Shore

organic matter

brown surface

overwhelming

throughout

Comments:

Grab Number:

Water Depth:

Penetration/Sampled Depth:

Time:

Biosassay / Chemistry (circle) AVS/SEM: Total Sulfides: VOC Sample (circle)

Sediment Type:

Sediment Color:

Sediment Odor:

cobble

D.O.

none

H2S

gravel

gray

slight

Petroleum

sand C M F

black

moderate

other:

silt clay

brown

strong

Shore

organic matter

brown surface

overwhelming

throughout

Comments:

Recorded by:

Ryan Barth



Surface Sediment Field Sample Record

Collection Date: 10/24/02

Shipping Date: 10/28/02

Project Name: Barber Mills Project No: 220059-01 T3 Station ID: BMPP-11

Sampling Crew: R. Barth, E. Parker

Sampling Vessel: Skiff

Sampling Method: Van Veen

Subcontractor(s):

Station Coordinates: N / Lat.

Weather:

E / W / Long.

Datum: NAD 83 / WGS 84

Zone:

Sample Number: BMPP-11

Analyses: Metals / BNAs / VOCs / PCBs / Pest / Herb / TBTs / Oils-Fats

TS / Grain Size / TDC / TVS / Ammonia / Sulfides

(Circle Appropriate Analyses)

Field Test Results

Comments:

Salinity: ppt

Ammonia: mg/L

Grain Size: #4 Coarse: ml Fines:

Grab Number: 1 Water Depth: 19.1 Penetration/Sampled Depth: Mean/10cm Time: 1345

Bioassay / Chemistry (circle) AVS/SEM; Total Sulfides; VOC Sample (circle)

Sediment Type:	Sediment Color:	Sediment Odor:	Comments:
cobble	D.O.	none	H2S
gravel	gray	slight	Petroleum
sand C M F	black	moderate	other:
silt clay	brown	strong	
organic matter	brown surface	overwhelming	

Grab Number: 1 Water Depth: Penetration/Sampled Depth: Time:

Bioassay / Chemistry (circle) AVS/SEM; Total Sulfides; VOC Sample (circle)

Sediment Type:	Sediment Color:	Sediment Odor:	Comments:
cobble	D.O.	none	H2S
gravel	gray	slight	Petroleum
sand C M F	black	moderate	other:
silt clay	brown	strong	5 light
organic matter	brown surface	overwhelming	Sham

Grab Number: Water Depth: Penetration/Sampled Depth: Time:

Bioassay / Chemistry (circle) AVS/SEM; Total Sulfides; VOC Sample (circle)

Sediment Type:	Sediment Color:	Sediment Odor:	Comments:
cobble	D.O.	none	H2S
gravel	gray	slight	Petroleum
sand C M F	black	moderate	other:
silt clay	brown	strong	
organic matter	brown surface	overwhelming	

Grab Number: Water Depth: Penetration/Sampled Depth: Time:

Bioassay / Chemistry (circle) AVS/SEM; Total Sulfides; VOC Sample (circle)

Sediment Type:	Sediment Color:	Sediment Odor:	Comments:
cobble	D.O.	none	H2S
gravel	gray	slight	Petroleum
sand C M F	black	moderate	other:
silt clay	brown	strong	
organic matter	brown surface	overwhelming	

Recorded by: Ryan Barth



Surface Sediment Field Sample Record

Collection Date: 10/28/02

Shipping Date: 10/28/02

Project Name: Barber Hills Project No: 02059-01 T3 Station ID: BMPD-12

Sampling Crew: R. Barth, E. Parker

Sampling Vessel: Skiff

Sampling Method: Van Veen

Subcontractor(s):

Station Coordinates: N / Lat.

Weather:

E / W / Long.

Datum: NAD 83 / WGS 84

Zone:

Sample Number: BMPD-12

Analysis: Metals / BNAs / VOCs / PCBs / Pest / Herb / TBTs / Diox-Furans

TS / Grain Size / TOC / TVS / Ammonia / Sulfides

(Circle Appropriate Analyses)

Field Test Results

Salinity: _____ ppt

Ammonia: _____ mg/L

Grain Size: _____ ml Coarser

ml Finer: _____

Comments:

Slight clogging of van Veen
by wood debris.
Small amount of winnowing

Grab Number: 1 Water Depth: 4.0' Penetration/Sampled Depth: 17cm / 0.1m Time: 1355

Biosassay / Chemistry (circle) AVS/SEM; Total Sulfides; VOC Sample (circle)

Sediment Type:	Sediment Color:	Sediment Odor:	
cobble	D.O.	none	H ₂ S
gravel	gray	slight	Petroleum
sand C.M.F.	black	moderate	other:
silt clay	brown	strong	No show
organic matter	brown surface	overwhelming	

Comments:

~25% wood by volume (visual)

Grab Number: _____ Water Depth: _____ Penetration/Sampled Depth: _____ Time: _____

Biosassay / Chemistry (circle) AVS/SEM; Total Sulfides; VOC Sample (circle)

Sediment Type:	Sediment Color:	Sediment Odor:	
cobble	D.O.	none	H ₂ S
gravel	gray	slight	Petroleum
sand C.M.F.	black	moderate	other:
silt clay	brown	strong	
organic matter	brown surface	overwhelming	

Comments:

Grab Number: _____ Water Depth: _____ Penetration/Sampled Depth: _____ Time: _____

Biosassay / Chemistry (circle) AVS/SEM; Total Sulfides; VOC Sample (circle)

Sediment Type:	Sediment Color:	Sediment Odor:	
cobble	D.O.	none	H ₂ S
gravel	gray	slight	Petroleum
sand C.M.F.	black	moderate	other:
silt clay	brown	strong	
organic matter	brown surface	overwhelming	

Comments:

Grab Number: _____ Water Depth: _____ Penetration/Sampled Depth: _____ Time: _____

Biosassay / Chemistry (circle) AVS/SEM; Total Sulfides; VOC Sample (circle)

Sediment Type:	Sediment Color:	Sediment Odor:	
cobble	D.O.	none	H ₂ S
gravel	gray	slight	Petroleum
sand C.M.F.	black	moderate	other:
silt clay	brown	strong	
organic matter	brown surface	overwhelming	

Comments:

Recorded by:

Ryan Barth



Surface Sediment Field Sample Record

Collection Date: 10/25/02

Shipping Date: 10/25/02

Project Name: Barber Mills

Project No: 020059-01

Station ID: BHPD-13

Sampling Crew: R. Barth, E. Parker

Sampling Vessel: Shift

Sampling Method: Van Veen

Subcontractor(s):

Station Coordinates: N / Lat.

Weather: overcast

E / W / Long.

Datum: NAD 83 / WGS 84

Zone:

Sample Number: BHPD-13 & BHPD-13R

Analysis: Metals / BNAs / VOCs / PCBs / Pahl / Herb / TBTs / Diox-Furans

(E) Grain Size / (C) TVS / Ammonia / Sulfides

(Circle Appropriate Analyses)

Field Test Results

Salinity: _____ ppt

Ammonia: _____ mg/L

Grain Size: _____ ml Coarse: _____

ml Fine: _____

Comments: Duplicate (collocated)
taken at this station

Grab Number: 1

Water Depth: 12.5'

Penetration/Sampled Depth: 18cm / 10

Time: 1415

Biosassay / Chemistry (circle)

AVS/SEM; Total Sulfides; VOC Sample (circle)

Sediment Type:

Sediment Color:

Sediment Odor:

Comments:

cobble

D.O.

none

H₂S

gravel

gray

slight

Petroleum

sand & M.F.

black

moderate

other:

silt clay

brown

strong

organic matter

brown surface

overwhelming

~25% wood debris
by volume

Grab Number: 2 (duplicate)

Water Depth: 12.1'

Penetration/Sampled Depth: 12cm / 10

Time: 1420

Biosassay / Chemistry (circle)

AVS/SEM; Total Sulfides; VOC Sample (circle)

Sediment Type:

Sediment Color:

Sediment Odor:

Comments:

cobble

D.O.

none

H₂S

gravel

gray

slight

Petroleum

sand & M.F.

black

moderate

other:

silt clay

brown

strong

organic matter

brown surface

overwhelming

~25% wood debris
by volume

Grab Number: _____

Water Depth: _____

Penetration/Sampled Depth: _____

Time: _____

Biosassay / Chemistry (circle)

AVS/SEM; Total Sulfides; VOC Sample (circle)

Sediment Type:

Sediment Color:

Sediment Odor:

Comments:

cobble

D.O.

none

H₂S

gravel

gray

slight

Petroleum

sand & M.F.

black

moderate

other:

silt clay

brown

strong

organic matter

brown surface

overwhelming

Grab Number: _____

Water Depth: _____

Penetration/Sampled Depth: _____

Time: _____

Biosassay / Chemistry (circle)

AVS/SEM; Total Sulfides; VOC Sample (circle)

Sediment Type:

Sediment Color:

Sediment Odor:

Comments:

cobble

D.O.

none

H₂S

gravel

gray

slight

Petroleum

sand & M.F.

black

moderate

other:

silt clay

brown

strong

organic matter

brown surface

overwhelming

Recorded by: Ryan Barth



Surface Sediment Field Sample Record

Collection Date: 10/29/02
Shipping Date: 10/28/02

Project Name: Barber Mills Project No: 020059-01 T3 Station ID: BMPP-14

Sampling Crew: R. Butler, E. Parker

Sampling Vessel: Skiff

Sampling Method: Van Veen

Subcontractor(s):

Station Coordinates: N / Lat.

Weather: Overcast

E / W / Long

Datum: NAD 83 / WGS 84

Zone:

Sample Number: BMPP-14

Analysis: Metals / BNA's / VOC's / PCB's / Pest / Herb / TBT's / Diox-Furans

TS / Grain Size / TOD / TVS / Ammonia / Sulfides

(Circle Appropriate Analyses)

Field Test Results

Salinity: _____ ppt

Ammonia: _____ mg/L

Grain Size: _____ ml Coarse: _____

ml Fine: _____

Comments: Some small wood debris
in jars leading to
slight overwatering

Grab Number: 1 Water Depth: 15.8' Penetration/Sampled Depth: 15cm / 10cm Time: 1450

Biosassay / Chemistry (circle) AVS/SEM; Total Sulfides; VOC Sample (circle)

Sediment Type:	Sediment Color:	Sediment Odor:
cobble	D.O.	none
gravel	gray	slight
sand C M F	black	moderate
silt clay	brown	strong
organic matter	brown surface	overwhelming

Comments: ~10% wood weight
by volumeGrab Number: _____ Water Depth: _____ Penetration/Sampled Depth: _____ Time: _____
Biosassay / Chemistry (circle) AVS/SEM; Total Sulfides; VOC Sample (circle)

Sediment Type:	Sediment Color:	Sediment Odor:
cobble	D.O.	none
gravel	gray	slight
sand C M F	black	moderate
silt clay	brown	strong
organic matter	brown surface	overwhelming

Comments:

Grab Number: _____ Water Depth: _____ Penetration/Sampled Depth: _____ Time: _____
Biosassay / Chemistry (circle) AVS/SEM; Total Sulfides; VOC Sample (circle)

Sediment Type:	Sediment Color:	Sediment Odor:
cobble	D.O.	none
gravel	gray	slight
sand C M F	black	moderate
silt clay	brown	strong
organic matter	brown surface	overwhelming

Comments:

Grab Number: _____ Water Depth: _____ Penetration/Sampled Depth: _____ Time: _____
Biosassay / Chemistry (circle) AVS/SEM; Total Sulfides; VOC Sample (circle)

Sediment Type:	Sediment Color:	Sediment Odor:
cobble	D.O.	none
gravel	gray	slight
sand C M F	black	moderate
silt clay	brown	strong
organic matter	brown surface	overwhelming

Comments:

Recorded by: Ryan Butler



Surface Sediment Field Sample Record

Collection Date: 10/20/02

Shipping Date: 10/20/02

Project Name: Barber Mills

Project No: 020059-01 T3

Station ID: BMPD-22

Sampling Crew: <u>B. Barth, E. Parker</u>	Sampling Method: <u>van Veen</u>
Sampling Vessel: <u>Skiff</u>	
Subcontractor(s):	
Station Coordinates: N / Lat. _____	Weather: _____
E / W / Long _____	
Date: <u>NAD 83 / WGS 84</u>	Zone: _____

Sample Number: <u>BMPD-22</u>
Analyses: <u>Metals / BNAs / VOCs / PCBs / Pest / Herb / TBTs / Dix-Furans</u>
<u>(TS) Grain Size (TOC) / VS / Ammonia / Sulfides</u>
(Circle Appropriate Analyses)

Field Test Results	Comments: _____
Salinity: _____ ppt	
Ammonia: _____ mg/L	
Grain Size: <u>ml Coarser: _____</u>	<u>ml Finer: _____</u>

Grab Number: <u>1</u>	Water Depth: <u>22.0'</u>	Penetration/Sampled Depth: <u>From / Ocean</u>	Time: <u>1530</u>
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Bioassay / Chemistry (circle)	AVS/SEM: Total Sulfides; VOC Sample (circle)	
Sediment Type:	Sediment Color:	Sediment Odor:
cobble	D.O.	none
gravel	gray	slight
sand C.M.F.	black	moderate
silt clay	brown	strong
organic matter	brown surface	overwhelming
<u>Silty sand, fine</u>	<u>gray</u>	<u>slight</u>
<u>wood fragments</u>	<u>black</u>	<u>moderate</u>
<u>fragments</u>	<u>brown</u>	<u>strong</u>
<u>inorganic</u>	<u>brown surface</u>	<u>overwhelming</u>
		<u>H2S</u>
		<u>Petroleum</u>
		<u>other:</u>
		<u>Globules of Sheen</u>
		<u>25% wood weight by volume (visual)</u>

Grab Number: _____	Water Depth: _____	Penetration/Sampled Depth: _____	Time: _____
Bioassay / Chemistry (circle)	AVS/SEM: Total Sulfides; VOC Sample (circle)		
Sediment Type:	Sediment Color:	Sediment Odor:	
cobble	D.O.	none	
gravel	gray	slight	
sand C.M.F.	black	moderate	
silt clay	brown	strong	
organic matter	brown surface	overwhelming	
		<u>H2S</u>	
		<u>Petroleum</u>	
		<u>other:</u>	

Grab Number: _____	Water Depth: _____	Penetration/Sampled Depth: _____	Time: _____
Bioassay / Chemistry (circle)	AVS/SEM: Total Sulfides; VOC Sample (circle)		
Sediment Type:	Sediment Color:	Sediment Odor:	
cobble	D.O.	none	
gravel	gray	slight	
sand C.M.F.	black	moderate	
silt clay	brown	strong	
organic matter	brown surface	overwhelming	
		<u>H2S</u>	
		<u>Petroleum</u>	
		<u>other:</u>	

Grab Number: _____	Water Depth: _____	Penetration/Sampled Depth: _____	Time: _____
Bioassay / Chemistry (circle)	AVS/SEM: Total Sulfides; VOC Sample (circle)		
Sediment Type:	Sediment Color:	Sediment Odor:	
cobble	D.O.	none	
gravel	gray	slight	
sand C.M.F.	black	moderate	
silt clay	brown	strong	
organic matter	brown surface	overwhelming	
		<u>H2S</u>	
		<u>Petroleum</u>	
		<u>other:</u>	

Recorded by:

Ryan Barth



Surface Sediment Field Sample Record

Collection Date: 10/23/02

Shipping Date: 10/23/02

Project Name: Balboa HillsProject No: 02059-01-T3Station ID: BMFPD-23Sampling Crew: R. Barth, E. ParkerSampling Vessel: ShiffSampling Method: Van Veen

Subcontractor(s):

Station Coordinates: N / Lat.

Weather:

E / W / Long.

Datum: NAD 83 / WGS 84

Zone:

Sample Number: BMFPD-23

Analysis: Metals / BNAs / VOCs / PCBs / Pest / Herb / TBTs / Diox-Furans

TS / Grain Size TOC / VS / Ammonia / Sulfides

(Circle Appropriate Analyses)

Field Test Results

Comments:

Salinity: _____ ppt

Ammonia: _____ mg/L

Grain Size: ml Coarse: _____ ml Fines: _____

Grab Number: 1 Water Depth: 22.8' Penetration/Sampled Depth: 16/10 cm Time: 1440

Biosassay / Chemistry (circle) AVS/SEM; Total Sulfides; VOC Sample (circle)

Sediment Type:	Sediment Color:	Sediment Odor:
cobble	D.O.	none
gravel	gray	slight
sand C M F	black	moderate
silt clay	brown	strong
organic matter	brown surface	overwhelming

Comments:

<5% wood
weight by volume
(visual)

Grab Number: _____ Water Depth: _____ Penetration/Sampled Depth: _____ Time: _____

Biosassay / Chemistry (circle) AVS/SEM; Total Sulfides; VOC Sample (circle)

Sediment Type:	Sediment Color:	Sediment Odor:
cobble	D.O.	none
gravel	gray	slight
sand C M F	black	moderate
silt clay	brown	strong
organic matter	brown surface	overwhelming

Comments:

Grab Number: _____ Water Depth: _____ Penetration/Sampled Depth: _____ Time: _____

Biosassay / Chemistry (circle) AVS/SEM; Total Sulfides; VOC Sample (circle)

Sediment Type:	Sediment Color:	Sediment Odor:
cobble	D.O.	none
gravel	gray	slight
sand C M F	black	moderate
silt clay	brown	strong
organic matter	brown surface	overwhelming

Comments:

Grab Number: _____ Water Depth: _____ Penetration/Sampled Depth: _____ Time: _____

Biosassay / Chemistry (circle) AVS/SEM; Total Sulfides; VOC Sample (circle)

Sediment Type:	Sediment Color:	Sediment Odor:
cobble	D.O.	none
gravel	gray	slight
sand C M F	black	moderate
silt clay	brown	strong
organic matter	brown surface	overwhelming

Comments:

Recorded by: Ryan Barth



Analytical Resources, Incorporated

Analytical Chemists and Consultants

5 November 2002

Ryan Barth
Anchor Environmental, L.L.C.
1411 4th Avenue
Suite 1210
Seattle, WA 98101

RE: Client Project: Barbee Mills
ARI Job No: EX78

Dear Ryan:

Please find enclosed the original Chain-of-Custody record and the final analytical results for the sample from the project referenced above. Thirteen sediment samples were received on October 29, 2002. The samples were analyzed for total solids and total organic carbon as requested.

There were no problems associated with these analyses.

A copy of these results will be kept on file. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,

ANALYTICAL RESOURCES, INC.

Mark D. Harris
Project Manager
206/695-6210
<mark@arilabs.com>

Enclosures

cc: file EX78

MDH/ej

E x 78



Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila WA 98168
206-695-6200 206-695-6201 (fax)

Chain of Custody Record & Laboratory Analysis Request

Page 1 of 1 02-6822-16039 Turn Around Requested: Rapid

Report to: <u>Michelle McLellan</u>		Project Name: <u>Bamboo Mills</u>		Analyses Requested		Notes/Comments
Company: <u>Anchor</u>		Proj Number:				
Address: <u>1411 4th Ave Ste 620</u>		City: <u>R. Barth</u>				
State: <u>Seattle, WA 98101</u>		E. Parker				
Phone: <u>206-9130</u>		Shipping Method: <u>Fed Ex</u>				
Fax: <u>206-9131</u>		Arrival:				
Sample ID	Sample Date	Sample Time	Sample Matrix	No. Containers		
BMPD-01	10/29/02	1100	SED	1	X	
BMPD-06		1120				
BMPD-07		1200				
BMPD-09		1205				
BMPD-10		1205				
BMPD-11		1345				
BMPD-12		1355				
BMPD-13		1414				
BMPD-13R		1430				
BMPD-14		1450				
BMPD-22		1330				
BMPD-23	10/29/02	1440				
BMPD-02	10/29/02	1120	SED	1	X	
Relinquished: <u>Ryan Barth</u>		Received by: <u>Deborah Johnson</u>		Special Instructions/Notes		
(Signature)		(Signature)		Attn: Mark Harris		
Printed name: <u>Ryan Barth</u>		Printed name: <u>Deborah Johnson</u>				
Company: <u>Anchor</u>		Company: <u>ARI</u>				
Date: <u>10/29/02</u>	Time: <u>1630</u>	Date: <u>10/29/02</u>	Time: <u>9:45</u>			
				Number of Coolers:		
				Cooler Temp(s): <u>2.0</u>		
				DOC Seal Intact:		
				Bottles Intact:		

Client of Verity: Analytical Resources, Inc. (ARI) will perform all requested services in accordance with appropriate methodology follow ARI Standard Operating Procedures and Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the invoiced amount for said services. The acceptance by the client of a proposal for services by ARI releases ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the client.

Please sign here if you would like these samples disposed of after expiration of standard archive times (60 days for water 90 days for soils, sediments per contract). If you do not want these samples discarded we will begin charging you for storage after the disposal date. Samples to be discarded after expiration:

QA Report - Method Blank Analysis

Matrix: Sediment

QC Report No: EX78-Anchor Environmental
Project: Barber Mill

Date Received: NA

Data Release Authorized: *ash*

Reported: 11/04/02

METHOD BLANK RESULTS
CONVENTIONALS

Analysis

<u>Date & Batch</u>	<u>Constituent</u>	<u>Units</u>	<u>Result</u>
Method Blank			
10/29/02 10292#1	Total Solids	mg residue	< 0.01 U
Method Blank			
11/04/02 11042#1	Total Organic Carbon	Percent	< 0.005 U

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: RMPT-01

Lab Sample ID: EX78A

QC Report No: EX78-Anchor Environmental

LIMS ID: 02-16022

Project: Barbee Mill

Matrix: Sediment

Date Sampled: 10/28/02

Data Release Authorized: *JA*

Date Received: 10/29/02

Reported: 11/04/02

Analyte	Analysis		Dilution		Units	Result
	Date/Batch	Method	Factor	RL		
Total Solids	10/29/02	EPA 160.1		0.01	Percent	38.7
	10292#1	SM 2540 B				
Total Organic Carbon	11/04/02	Plumb, 1981		0.0050	Percent	6.3
	11042#1					

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for EX78 received 10/29/02

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: BMFD-06

Lab Sample ID: EX788

QC Report No: EX78-Anchor Environmental

LIMS ID: 02-16023

Project: Barbee Mill

Matrix: Sediment

Date Sampled: 10/29/02

Data Release Authorized: JWB

Date Received: 10/29/02

Reported: 11/04/02

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/29/02	EPA 160.3		0.01	Percent	41.6
	10292#1	SM 2540 B				
Total Organic Carbon	11/04/02	Fluorob. 1981		0.0050	Percent	5.8
	11042#1					

RL Analytical reporting limit

U Undetected at reported detection limit

B Analyte found in method blank above detection

Report for EX78 received 10/29/02

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: HMPD-07

Lab Sample ID: EX78C

QC Report No: EX78-Anchor Environmental

LIMS ID: 02-16024

Project: Barber Mill

Matrix: Sediment

Date Sampled: 10/28/02

Data Release Authorized: *gsk*

Date Received: 10/29/02

Reported: 11/04/02

Analyte	Analysis		Dilution		Units	Result
	Date/Batch	Method	Factor	RL		
Total Solids	10/29/02	EPA 160.3		0.01	Percent	33.1
	10292#1	SM 2540 B				
Total Organic Carbon	11/04/02	Plumb, 1981		0.0050	Percent	4.9
	11042#1					

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for EX78 received 10/29/02

Final Report
Laboratory Analysis of Conventional Parameters**Sample No: EMFD-09**

Lab Sample ID: EX78D

QC Report No: EX78-Anchor Environmental

LIMS ID: 02-16025

Project: Barbee Mill

Matrix: Sediment

Date Sampled: 10/28/02

Data Release Authorized: *gk*

Date Received: 10/29/02

Reported: 11/04/02

Analyte	Analysis		Dilution		Units	Result
	Date/Batch	Method	Factor	RL		
Total Solids	10/29/02	EPA 160.3		0.01	Percent	37.1
	10292#1	SM 2540 B				
Total Organic Carbon	11/04/02	Plumb, 1981		0.0050	Percent	5.7
	11042#1					

RL Analytical reporting limit

U Undetected at reported detection limit

B Analyte found in method blank above detection

Report for EX78 received 10/29/02

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: EX78-10

Lab Sample ID: EX78E

OC Report No: EX78-Anchor Environmental

LIMS ID: 02-16026

Project: Barbos Mill

Matrix: Sediment

Date Sampled: 10/28/02

Data Release Authorized: JAR

Date Received: 10/29/02

Reported: 11/04/02

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/29/02	EPA 160.3		0.01	Percent	33.7
	1029241	SM 2540 B				
Total Organic Carbon	11/04/02	Plumb, 1981		0.0050	Percent	6.4
	1104241					

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for EX78 received 10/29/02

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: BMPD-11

Lab Sample ID: EX78P

QC Report No: EX78-Anchor Environmental

LIMS ID: 02-16027

Project: Barbee Mill

Matrix: Sediment

Date Sampled: 10/28/02

Data Release Authorized: 

Date Received: 10/29/02

Reported: 11/04/02

Analyte	Analysis		Dilution		Units	Result
	Date/Batch	Method	Factor	RL		
Total Solids	10/29/02	EPA 160.3		0.01	Percent	67.5
	10292#1	SM 2540 B				
Total Organic Carbon	11/04/02	Plumb, 1981		0.0050	Percent	3.5
	11042#1					

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for EX78 received 10/29/02

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: BMVD-12

Lab Sample ID: EX78G

QC Report No: EX78-Anchor Environmental

LIMS ID: 02-16028

Project: Barbee Mill

Matrix: Sediment

Date Sampled: 10/28/02

Data Release Authorized: *DAF*

Date Received: 10/29/02

Reported: 11/04/02

Analyte	Analysis		Dilution		Units	Result
	Date/Batch	Method	Factor	RL		
Total Solids	10/29/02	EPA 160.3		0.01	Percent	43.1
	10292#1	SM 2540 B				
Total Organic Carbon	11/04/02	Flumab, 1981		0.0050	Percent	5.0
	11042#1					

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for EX78 received 10/29/02

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: EXPD-11

Lab Sample ID: EX78W

DC Report No: EX78-Anchor Environmental

LIMS ID: 02-16029

Project: Barber Mill

Matrix: Sediment

Date Sampled: 10/28/02

Data Release Authorized: *QW*

Date Received: 10/29/02

Reported: 11/04/02

Analyte	Analysis		Dilution		Units	Result
	Date/Batch	Method	Factor	RL		
Total Solids	10/29/02 10292#1	EPA 160.3 SM 2540 B		0.01	Percent	38.7
Total Organic Carbon	11/04/02 11042#1	Plumb, 1981		0.0050	Percent	7.3

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for EX78 received 10/29/02

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: BOPD-112

Lab Sample ID: EK781

GC Report No: EK78-Anchor Environmental

LIMS ID: D2-16030

Project: Barber Mill

Matrix: Sediment

Date Sampled: 10/28/02

Data Release Authorized: 

Date Received: 10/29/02

Reported: 11/04/02

Analyte	Analysis		Dilution		Units	Result
	Date/Batch	Method	Factor	RL		
Total Solids	10/29/02	EPA 160.3		0.01	Percent	16.3
	10292#1	SM 2540 B				
Total Organic Carbon	11/04/02	Plumb. 1983		0.0050	Percent	6.8
	11042#1					

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for EK78 received 10/29/02

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: BMPD-14

Lab Sample ID: EX78J

QC Report No: EX78-Anchor Environmental

LIMS ID: 02-16031

Project: Barber Mill

Matrix: Sediment

Date Sampled: 10/28/02

Data Release Authorized: *W*

Date Received: 10/29/02

Reported: 11/04/02

Analyte	Analysis		Dilution		Units	Result
	Date/Batch	Method	Factor	RL		
Total Solids	10/29/02	EPA 160.3		0.01	Percent	25.7
	10292#1	SM 2540 B				
Total Organic Carbon	11/04/02	Plumb.1981		0.0050	Percent	6.0
	11042#1					

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for EX78 received 10/29/02

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: MWFD-15-BB

Lab Sample ID: ER31A QC Report No: ER31-Anchor Environmental
LINE ID: 02-11408 Project: BARBER MILLS
Matrix: Sediment Whatcom Waterway Sediments
Date Sampled: 08/21/02
Data Release Authorized: *AS* Date Received: 08/22/02
Reported: 08/29/02 Amy S. Phillips

Analyte	Analysis		Dilution		Units	Result
	Date/Batch	Method	Factor	RL		
Total Solids	08/26/02	EPA 160.3		0.01	Percent	49.3
	0826281	SM 2540 B				
Total Organic Carbon	08/27/02	Plumb, 1981		0.0050	Percent	5.5
	0827281					

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for ER31 received 08/22/02

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: BW21-16-BB

Lab Sample ID: BR31B QC Report No: BR31-Anchor Environmental
LIMS ID: 02-11409 Project: BARBER MILLS
Matrix: Sediment Whatcom Waterway Sediments
Data Released Authorized: *W-1* Date Sampled: 08/21/02
Reported: 08/29/02 Amy B. Phillips Date Received: 08/22/02

Analyte	Analysis		Dilution		Units	Result
	Date/Batch	Method	Factor	RL		
Total Solids	08/26/02	EPA 160.3		0.01	Percent	62.1
	08262#1	BM 2540 B				
Total Organic Carbon	08/27/02	Plumb, 1981		0.0050	Percent	3.3
	08272#1					

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for BR31 received 08/22/02

Final Report

Laboratory Analysis of Conventional Parameters

Sample No: MFD-19-88

Lab Sample ID: BR11C

OC Report No: E031-Anchor Environmental

LINCS ID: 02-11410

Project: BAKERIE MILLS

Nachfr. Sediment

Whitson Waterway Sediments

Date Sampled: 08/21/02

DATA RELEASE AUTHORIZED: QAP

Date Received: 08/32/02

Reported: 08/29/02 Amy B. Phillips

Analyte	Analysis		Dilution Factor	RL	Units	Result
	Date/Batch	Method				
Total Solids	08/26/02 08262#1	EPA 160.1 SM 2540 B		0.01	Percent	30.1
Total Organic Carbon	08/27/02 08272#1	Plumb, 1981		0.0050	Percent	6.2

RL	Analytical reporting limit
U	Undetected at reported detection limit
B	Analyte found in method blank above detection

Report for ED31 received 08/22/02

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: SMPD-20-00

Lab Sample ID: ER31D QC Report No: ER31-Anchor Environmental
LIMS ID: 02-11411 Project: BARBER MILLS
Matrix: Sediment Whatcom Waterway Sediments
Date Sampled: 08/21/02
Data Release Authorized: *AS* Date Received: 08/22/02
Reported: 08/29/02 Amy S. Phillips

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	08/26/02	EPA 160.3		0.01	Percent	33.4
	0826281	SM 2540 B				
Total Organic Carbon	08/27/02	Plumb, 1981		0.0050	Percent	7.7
	0827281					

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for ER31 received 08/22/02

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 2000-21-00

Lab Sample ID: ER31E QC Report No: ER31-Anchor Environmental
LIMS ID: 02-11417 Project: BARBER MILLS
Matrix: Sediment Whatcom Waterway Sediments
Date Sampled: 08/21/02
Data Release Authorized: *awp* Date Received: 08/22/02
Reported: 08/23/02 Amy S. Phillips

Analyte	Analysis		Dilution		Units	Result
	Date/Batch	Method	Factor	RL		
Total Solids	08/26/02	EPA 160.3		0.01	Percent	60.0
	0826241	SM 2540 D				
Total Organic Carbon	08/27/02	Plumb, 1981		0.0050	Percent	4.1
	0827241					

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for ER31 received 08/22/02

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: EMPD-22

Lab Sample ID: EX78K

QC Report No: EX78-Anchor Environmental

LIMS ID: 02-16032

Project: Barbos Mill

Matrix: Sediment

Date Sampled: 10/28/02

Data Release Authorized: JMT

Date Received: 10/29/02

Reported: 11/04/02

Analyte	Analysis		Dilution		Units	Result
	Date/Batch	Method	Factor	RL		
Total Solids	10/29/02	BPA 160.3		0.01	Percent	22.4
	10292#1	SM 2540 B				
Total Organic Carbon	11/04/02	Plumb.1981		0.0050	Percent	7.3
	11042#1					

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for EX78 received 10/29/02

Final Report
Laboratory Analysis of Conventional Parameters**Sample No: BMPD-23**

Lab Sample ID: EX78L

QC Report No: EX78-Anchor Environmental

LIMS ID: 02-16033

Project: Barbee Mill

Matrix: Sediment

Date Sampled: 10/28/02

Data Release Authorized: *[Signature]*

Date Received: 10/29/02

Reported: 11/04/02

Analyte	Analysis		Dilution		Units	Result
	Date/Batch	Method	Factor	RL		
Total Solids	10/29/02	EPA 160.3		0.01	Percent	27.7
	10292#1	SM 2540 B				
Total Organic Carbon	11/04/02	Plumb, 1981		0.0050	Percent	5.6
	11042#1					

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for EX78 received 10/29/02

Final Report
Laboratory Analysis of Conventional Parameters**Sample No: BMPD-02**

Lab Sample ID: EX78M

QC Report No: EX78-Anchor Environmental

LIMS ID: 02-16034

Project: Barbas Mill

Matrix: Sediment

Date Sampled: 10/28/02

Data Release Authorized: 

Date Received: 10/29/02

Reported: 11/04/02

Analyte	Analysis		Dilution		Units	Result
	Date/Batch	Method	Factor	RL		
Total Solids	10/29/02	EPA 160.3		0.01	Percent	27.3
	10292#1	SM 2540 B				
Total Organic Carbon	11/04/02	Plumb. 1981		0.0050	Percent	13
	11042#1					

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for EX78 received 10/29/02

QA Report - Method Blank Analysis

QC Report No: E231-Anchor Environmental
Matrix: Sediment Project: BAZZEE MILLS
Whitcom Waterway Sediments
Date Received: NA
Data Release Authorized: LAF
Reported: 08/29/02 Amy S. Phillips

METHOD BLANK RESULTS
CONVENTIONAL

Analysis

Date & Batch	Constituent	Units	Result
Method Blank			
08/26/02	Total Solids	mg residue	< 0.01 U
0826241			
Method Blank			
08/27/02	Total Organic Carbon	Percent	<0.0050 U
0827241			



QA Report - Standard Reference Material Analysis

QC Report No: ER31-Anchor Environmental
Project: BARREX MILLS
Whetson Waterway Sediments
Date Received: NA

Data Release Authorized: DWP
Reported: 08/29/02 Amy S. Phillips

STANDARD REFERENCE MATERIAL ANALYSIS
CONVENTIONAL

Constituent	Units	Value	True Value	Recovery
NIST 8704				
Total Carbon	Percent	3.49	3.35	93.34
Date analyzed: 08/27/02 Batch ID: 0827241				

QA Report - Replicate Analysis

QC Report No: ER31-Anchor Environmental
Matrix: Sediment Project: BARBEE MILLS
Whatcom Waterway Sediments
Data Received: 08/22/02
Data Release Authorized: QA-
Reported: 08/29/02 Amy S. Phillips

REPLICATE ANALYSIS RESULTS
CONVENTIONALS

Constituent	Units	Sample Value	Replicate Value(s)	RPD/RSD
ARI ID: 02-11408, ER31 A Client Sample ID: D00PD-15-00				
Total Solids	Percent	49.3	50.1	RPD: 1.64
Total Organic Carbon	Percent	5.5	4.8 6.6	RSD: 16.14

QA Report - Matrix Spike/Matrix Spike Duplicate Analysis

QC Report No: EE31-Anchor Environmental
Matrix: Sediment Project: BARBEE MILLS
Wistcon Waterway Sediments
Date Received: 08/22/02
Data Release Authorized: ~~AA~~
Reported: 08/29/02 Amy B. Phillips

MATRIX SPIKE QA/QC REPORT
CONVENTIONALS

Constituent	Units	Sample Value	Spike Value	Spike Added	Recovery
ARI ID: 02-11000, EE31 & Client Sample ID: EEPD-15-55					
Total Organic Carbon	Percent	5.48	7.98	3.13	80.6%

MS/MSD Recovery Limits: 75 - 125 %

QA Report - Replicate Analysis

Matrix: Sediment

QC Report No: EX78-Anchor Environmental
Project: Barbee Mill

Date Received: 10/29/02

Data Release Authorized: *af*
Reported: 11/04/02REPLICATE ANALYSIS RESULTS
CONVENTIONALS

Constituent	Units	Sample Value	Replicate Value(s)	RPD/RSD
ARI ID: 02-16022, EX78 A Client Sample ID: SHPD-01				
Total Solids	Percent	38.7	37.6 38.5	RSD: 1.5%
Total Organic Carbon	Percent	6.3	6.1 6.3	RSD: 1.9%

QA Report - Matrix Spike/Matrix Spike Duplicate Analysis

Matrix: Sediment

QC Report No: EX78-Anchor Environmental
Project: Barbee Mill

Date Received: 10/29/02

Data Release Authorized: *DAF*

Reported: 11/04/02

MATRIX SPIKE QA/QC REPORT
CONVENTIONALS

Constituent	Units	Sample Value	Spike Value	Spike Added	Recovery
ARI ID: 02-16022, EX78 A Client Sample ID: MNPD-01					
Total Organic Carbon	Percent	6.34	14.7	8.17	102%

MS/MSD Recovery Limits: 75 - 125 %

Soil MS/MSD QA Report Page 1 for EX78 received 10/29/02



QA Report - Standard Reference Material Analysis

QC Report No: EX78-Anchor Environmental
Project: Barbee Mill

Date Received: NA

Data Release Authorized: *art*
Reported: 11/04/02STANDARD REFERENCE MATERIAL ANALYSIS
CONVENTIONAL

Constituent	Units	Value	True Value	Recovery
NIST 8704				
Total Carbon	Percent	3.51	3.35	105%
Date analyzed: 11/04/02 Batch ID: 11042#1				